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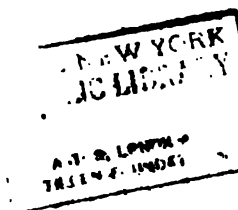




New York State Museum

Bulletin 63

PALEONTOLOGY 7



STRATIGRAPHIC AND PALEONTOLOGIC MAP

OF

CANANDAIGUA AND NAPLES QUADRANGLES

BY

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and

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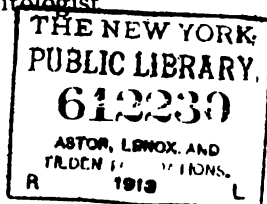
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PALEONTOLOGY 7



STRATIGRAPHIC AND PALEONTOLOGIC MAP OF CANANDAIGUA AND NAPLES QUADRANGLES

INTRODUCTION

The region covered by these maps is a classical one in the history of New York paleontology. In the days of the original survey of the old fourth district, 1836 to 1843, Prof. James Hall, the district geologist, frequently made headquarters on the beautiful shores of Canandaigua lake and both then and in later years the richly fossiliferous shale beds exposed along the lake shore and in its ravines, afforded to him inexhaustible resources for collecting their organic remains. As representative of the strata embraced within the "Hamilton group" no series of exposures in the State has been so thoroughly exploited as these. Canandaigua and its lake, 70 years ago, were easily accessible and so were the numerous villages scattered through northern Ontario county, but about the latter the rock exposures have always been few and hard to find because of the great thickness of the drift mantle. Southern Ontario was more remote and though the township of Naples was reached by Hall it was for a brief visit only, and its splendid exposures and interesting faunas were left for subsequent researches.

Canandaigua was the writer's home town and Naples the home of his pioneer ancestors in western New York. During the early years of youthful enthusiasm for geologic study the rocks of Canandaigua and vicinity were the subject of prolonged and careful analysis. In the days from 1870 to 1880 the entire fauna was studied in such detail that the vertical range of every known species, and many before unknown, of the Hamilton stage was established and from other formations large accretions to known facts were made. So productive were the investigations of this period in increasing our knowledge of these faunas that in the "Monograph of the North American Devonian Crustacea," published at a later date as volume 7 of the *Paleontology of New York* nearly 200 figures were given of trilobites and other crustaceans collected by the writer during this time and in this region.

The Portage strata of the township of Naples, as a result of careful researches begun then and continued till the present, opened up a virtually new fauna in the New York series. The study of the Portage fauna, desultory at first, began seriously only when in companionship with Mr D. Dana Luther, it was attacked with unremitting assiduity and in this companionship the exploitation of this fauna has been carried forward throughout the entire extent of this formation in the State. For 20 years no circumstances were permitted to interfere with the yearly joint attack on this problem, and though this long standing companionship in the field has been latterly interrupted by force of circumstance, Mr Luther has diligently carried on the refined stratigraphic study of the Naples rocks and their equivalents while the writer has been more specially concerned in the solution of the paleontologic and bionomic problems to which the faunas have given rise.

In 1885¹ the writer published a geologic map of Ontario county. Up to that time the rock formations of the region had not been delineated in greater detail than given on the old

¹N. Y. State Geol. 4th An. Rep't.

state map of 1843. This map, which was the summation of some years of observation, served a useful purpose and has been the basis of the maps herewith presented. Accompanying the map of 1885 was a brief account of the variations of the faunas according to the formations represented. Our present data enable and require us to analyze in closer detail variations in sedimentation sometimes accompanied and sometimes unaccompanied by variations in faunation. It was made clearly apparent by the writer's long study of the changes in the fauna of the Hamilton shales and limestones that very few variations of material importance in the composition of the fauna throughout the entire series of these deposits were tangible and this same condition has been shown to prevail in the deposits of this period wherever the sediments maintain the singularly homogeneous character shown in this section.¹

We have introduced a considerable diversity of coloration on these map sheets but such refined distinctions in sedimentation are now essential to the complete understanding of bionomic conditions and stratigraphic changes during the period of deposition of these strata. They are essential also as an aid to the correlation of the rock section here given to that in adjoining regions of the State. Many of the names may prove to serve only a local, perhaps some of them only a temporary, purpose. Certain of the divisions have however a higher value and indicate periods of uniform deposition over wide areas in western and central New York. An apology or excuse for the refinement of these stratigraphic subdivisions is not necessary. The multiplication of local names as formation terms is one of the imperative accompaniments of progress in the interpretation of ancient marine conditions.

¹The attempt thus made many years ago to determine a basis of subdivision in these homogeneous sediments on the basis of the range of the fossils, proved as inconsequent as similar efforts subsequently made in this series of sediments. Were one concerned to construct a doll's philosophy from imaginary laws conceived to govern the association of species into faunules the extraordinary uniformity of faunation in these beds should afford an oppugnant problem.

FORMATIONS

The rock formations here represented as units of sedimentation may be grouped in broader divisions in the manner following:

Neo-devonic	Chautauquan group	Chemung beds	Prattsburg
		Ithaca beds	{ West hill Grimes Hatch Rhinstreet Cashaqua
	Senecan group	Portage beds	{ Parrish (lentil in Cashaqua) Middlesex Standish
		Genesee beds	{ West river Genundewa Genesee
		Tully limestone	Tully
Meso-devonic	Erian group	Hamilton beds	{ Moscow Menteth (lentil in Moscow) Tichenor Canandaigua Skaneateles
		Marcellus beds	{ Cardiff Stafford Marcellus
		Onondaga beds	Onondaga
Paleo-devonic Siluric or Ontario	Ulsterian group	Oriskany beds	Oriskany
		Cobleskill beds	Cobleskill
	Cayugan group	Salina beds	{ Bertie Camillus.

SILURIC

General observations. All these formations are so deeply buried under a continuous drift mantle that their variations can be studied only at a disadvantage. We have indicated the contact lines of these as well as the lower Devonian formations as appended, by slightly undulating lines traversing the region in a nearly east and west direction. It is our belief that such lines bound the palpable outcrops over a region which before becoming enveloped in the drift was not deeply channeled and by the rigidity of its rocks was able to resist the erosion which further south has broken up the softer formations into projections and outliers.

Camillus shale

The lowest formation in the rock series and northernmost on the Canandaigua sheet is that subdivision of the Salina group of formations which consists of soft gypseous shale or plaster rock,

dark when fresh but becoming light ashen gray on exposure. These beds are both underlain and overlain by thin light gray magnesian limestones or platten dolomites. Entire thickness 50 feet.

On account of the meagerness of the exposures throughout the northern area of the Canandaigua quadrangle the exact position of the contact line between the red or Vernon shales and the gypseous Camillus shales, which is the equivalent of the rock beds of western New York, is not apparent. The lowest rock exposures are along Mud creek below Brownsville and in the bed of Ganargua creek just to the north of the north line of the sheet. Here are two outcrops, one just above and the other about 25 rods below the bridge, which show a few feet of very fine hard dark bluish drab limestones characterized by needle cavities or styliolites, which mark the magnesian limestones of the gypseous deposits of the Salina group elsewhere. These layers are easily broken into small and regularly shaped blocks. Between the dolomites are thin layers of bluish clay shales. In the Goose Egg, an oval hill 1 mile south of Brownsville on the west side of Ganargua creek there occurs the most northerly outcrop of the upper gypsum or plaster bed. The exposure is a small and isolated one and is obscured by drift and disintegrated shale. Gypsum was formerly quarried here. One mile farther south the gypsum outcrops at the foot of the declivity on the west side of the Ganargua creek channel and "land plaster" has been quarried here for many years and ground in Conover's mill near by. In consequence of the expense attending the stripping of the heavy covering of drift, 30 to 40 feet thick, the small amount of plaster produced in recent years has been mined, access to the bed being had through a horizontal tunnel at the base of the hill. The breast of the mine is 14 feet high. The gypsum is purest at the bottom. This bed is a continuation of the one from which "Onondaga land plaster" is obtained in Onondaga county; "Cayuga plaster" in the vicinity of Union Springs, Cayuga co., and "Vienna plaster" along the Canandaigua outlet in the western part of the town of Phelps. It is 30 to 40 feet thick in this region and is composed

of the hydrous sulfate principally in the impure condition and not infrequently appears crystallized as selenite and in flaky condition mixed with very soft dark bluish clayey shale. Where the gypsum predominates the rock has a distinctly crystalline appearance but where the proportion of shale is greatest the lines of sedimentation are very apparent and it has every resemblance to ordinary soft dark shale. Joints occur everywhere throughout the rock beds and through these the percolating waters have had access to the gypsum deposits and have frequently removed them, thereby causing a settling of the shale material adjacent and leaving hemispheric masses between the resultant depressions. Doubtless the present hummocky condition of the beds, not alone in this region but throughout the area of surface exposure of Camillus shales is largely due to causes connected with the change from anhydrite to the hydrous sulphate or gypsum. There are a few thin even layers of hard magnesian limestone interstratified with the gypsum and at the top of the bed there are 8 to 10 feet of soft blocky shales containing but very little gypsum. This latter bed is exposed at the east end of the Lehigh Valley Railroad cut 1 mile east of the village of Victor, and also in the bed of Mud creek near the Lehigh Valley Railroad bridge and at Fredon or East Victor. The more productive development of the gypsum industry in this region however is in the territory just east of the quadrangle in the town of Phelps, where for more than 70 years it has been produced on a large scale, though the production has now notably fallen away.

Bertie waterlime

This term, derived from Bertie township in western Ontario, is specially characterized by the abundant presence of the crustaceans *Eurypterus*, *Pterygotus* and *Ceratiocaris*. It consists chiefly, in the Canandaigua region, of hard dark impure hydraulic limestone in thick layers separated by thin seams of dark and apparently carbonaceous matter. The rock weathers to a light brown or buff. Thickness 40 feet.

The passage from the Camillus shales into these beds now termed Bertie waterlime is a very gradual one, the loss of gypsum being

replaced by the addition of alumina and carbonate of magnesia, so that the succeeding stratification becomes highly dolomitic. The distinguishing mark of the division as already noted, is the presence of merostome and phyllocarid crustaceans, which attained at this time their culmination of development.

Along the creek for 10 rods below the bridge at East Victor are from 30 to 40 feet of hard compact dolomites with distinct lines of sedimentation, having a characteristic clink and conchoidal fracture. The dark blue of the rock changes rapidly on exposure to a light, dark or ashen gray. The same horizon appears in the Lehigh Valley Railroad cut 1 mile east of Victor, though the exposure here is for only about 6 feet at the bottom, just over the Camillus shales. Eastward also in the adjoining quadrangle occasional exposures are seen. Remains of the crustaceans referred to are by no means as common here as at the well known localities to the west at Buffalo and to the east in Herkimer county but the horizon is doubtless the same, and segments, heads and appendages of these creatures are not uncommon. With them is frequently found a *Leperditia*, probably *L. alta* Conrad and the brachiopods *Whitfieldella laevis* Vanuxem and *Leptostrophia varistriata* Conrad.

Cobleskill shale and dolomite

This is a rather obscure representative of a formation which has recently been shown by the investigations of Hartnagel to extend without interruption from eastern New York to Buffalo and beyond. It is regarded as deposited soon after the close of the period of the Salina and it here consists of dark, hard shale and straticulate, impure limestone, succeeded by a thick bed of massive dolomite, the top of the formation consisting of platten dolomites. The thickness ascribed to these beds is approximately 42 feet, of which 18 feet are assigned to the shale, 20 feet to the heavy dolomite and 4 feet to the platten dolomite on top.

The section at East Victor exposes the massive beds of this horizon, immediately below the topmost layers constituting platten dolomite. In the high bluff on the east bank of the creek

in the rear of A. B. Cooper's residence there are beds of dolomite which, aggregating 8 feet in thickness at the base, are succeeded by 15 feet of dark bluish shale and these are overlain by 6 feet of dolomite like that below. Overlying these layers and exposed for many rods in the bed of the creek is a mass of tough argillaceous limestone 15 feet thick that bears *Stromatopora* quite abundantly and seems to indicate a western continuation of the well known *Stromatopora* bed at this horizon in Onondaga county. It is dark brownish gray when freshly broken and usually takes on a darker tinge of brown for a time owing to the exudation of a minute quantity of petroleum but finally turns to a light yellowish drab. It contains many small aggregations of selenite crystals, and the boulders from it by reason of their peculiarly tough character have survived glacial transportation and grinding and are strung in great numbers over the contiguous territory to the south, have many small cavities and a general scraggy appearance due to the weathering out of these crystals.

A bed of shaly dolomite 4 feet thick is the highest member of the group. This appears in the west bank of the creek a short distance below a low fold 60 rods north of the New York Central Railroad bridge at Mertensia. There are several small exposures of these upper beds in this vicinity, the most extensive of which is in the section afforded in the Hog hollow or Great brook ravine on the west side of Boughton hill, where 25 feet of the top layers are well displayed. The two upper members appear $\frac{1}{2}$ mile east of Fredon and have been quarried on the land of A. B. Cooper and Hiram Powell, and at the latter place there are the ruins of two limekilns where material from the *Stromatopora* layer was formerly burned and then hauled to Conover's mill and ground for cement; there are several other abandoned kilns in the vicinity in which quicklime was once produced from the purer layers below. No other exposures of these beds have been observed in this western portion of Ontario county, but they are of more frequent occurrence eastward, just beyond the line of the quadrangle and are there more freely worked and contain organic remains in greater

number. The fossils occurring here, besides the *Stromatopora*, are *Leperditia alta* Conrad and *L. scalaris* Jones, *Cyathophyllum hydraulicum* Simpson, *Spirifer eriensis* Grabau and *Whitfieldella sulcata* Vanuxem. Fragments of *Eurypterus* also occur at this horizon.

DEVONIC

General observations. The division line between the great Siluric and Devonic systems is very well marked here on account of the entire absence of the Helderbergian limestones, which, in the eastern part of the State, represent the incipient stages of Devonic deposition. There is good reason to believe that the uppermost Siluric beds which we have just considered were for a time exposed above water to the action of aerial decomposition and erosion before the later sediments were laid down on them. This has been found to be the case in Erie county, where the eroded upper surface of the Cobleskill dolomite is overlain by a regular deposition of the following formations.

Oriskany sandstone

In eastern New York this formation takes on, in certain places, the character of an arenaceous limestone but it is an interrupted deposit in its course across the State from east to west, though in places tremendously abounding in fossils. At Oriskany Falls and at Union Springs it assumes the character of a more or less friable whitish sandstone. The formation constantly thickens and thins, forming lenses, as in Cayuga county, sometimes 20 or more feet thick and then again thinning to actual disappearance. As it becomes thin it usually assumes the character of a hard compact quartzite composed of silicious grains cemented by a deposit of silica. Throughout western New York this thin bed frequently contains angular masses, evidently washed from the hydraulic limestone beneath and thus forms a breccia. In Ontario county the exposures of this rock are largely confined to the township of Phelps a few miles to the east of this quadrangle. From its uneven thickness and general appearance at this place and the fact that it fails entirely within a half mile on the east and a

mile on the west it would indicate here as elsewhere, that it was a deposit of a sand bar running out from the irregular coast line of the time. This deposit in the town of Phelps is the last of the lentils which the formation assumes in western New York. It is 6 feet, 6 inches thick and consists of several distinct layers. In the upper part of the top layer there are many elongate rounded pebbles and cobbles of black quartzite embedded in the light sandstone and the rest of the deposit is largely of coarse sand with a lumpy or slightly concretionary structure. In these outcrops the only evidence of fossils is the presence of a few obscure corals. On Mud creek 50 rods below the railroad bridge at Mertensia, there is an exposure of the same material but more quartzitic, containing the waterlime pebbles, the layer being 6 to 8 inches thick. In Phelps the sandstone was at one time quarried for firestone for use in the glass furnaces at Clyde.

Onondaga limestone

In general character this important deposit is a compact, dark bluish gray limestone frequently carrying interbedded layers of chert nodules, the limestone itself being bedded in layers from 6 inches to 3 feet in thickness. It contains a large amount of carbonaceous matter, which appears on the surface of the layers and in the shale partings between them and discolours most of the strata, frequently giving them a decidedly black appearance. It is removed by gradual decomposition on exposure and the rock slowly assumes a very light bluish gray color. The chert or hornstone is usually nearly black and slightly translucent, but sometimes lighter colored and bluish. It is very unevenly distributed in the beds in some of which it predominates and in others is entirely absent. The nodular layers in which it lies are frequently continuous for long distances and owing to their resistance to decomposing agencies, old exposures of the beds and the innumerable boulders and fragments from them strewn over the region south of the escarpment formed by this formation, have a peculiarly ragged and scraggy appearance. At some of the outcrops one or more of the layers are shaly but only a small proportion of the formation is of this character and all of the remainder, wherever

the amount of chert is not too large, is compact and durable and exceedingly valuable as building stone and for the production of quicklime. If the chert is entirely absent the limestone is easily quarried and makes very handsome dark gray cut stone building material, and the cherty masses have been extensively worked for bridge abutments, canal locks, retaining walls and kindred purposes.

This formation covers a belt 1 to 3 miles wide across the towns of Mendon, Victor and Farmington and some exposures of the uppermost beds occur also in Canandaigua. The more striking outcrops of the rock and those which have long been most available for exploitation are in the region just to the east, specially in the towns of Manchester and Phelps. In a general way it may be stated that at the base of the formation there are from 3 to 5 feet of limestone, very rich in corals and without any chert. The rest of the formation which attains a total thickness of about 120 feet has both chert and shaly layers scattered through the limestones at irregular intervals.

In Farmington the lower beds crop out on the north side of the road leading from Manchester to Victor and have been extensively quarried, the stone used in the construction of the Erie canal locks at Macedon having been obtained from this locality.

In the bed of Mud creek the base of the formation appears about 60 rods below the railroad bridge at Mertensia, in a low anticline, the axis of which crosses the stream diagonally. Here it rests on the Oriskany sandstone and the lower 5 feet are free of chert and are crowded with corals, the stratum being identical in character and appearance with the basal layer farther east. These layers are capped by a series of chert-bearing beds, together aggregating 5 feet in thickness. Above the bridge there is an extensive picturesque cascade and an exposure of 40 to 50 feet of the middle and upper beds, the outcrops extending though not continuously, 100 rods south of the cascade. The rock at this place has been worked for construction stone.

In the section along Great brook or Hog hollow at Victor the lower layers appear overlying the Oriskany and at this point the

rock was formerly quarried both for building stone and for burning. In the ledges of the creek above the quarry are some of the higher cherty layers.

For the most part however the formation is buried under the drift and from this point to the western limit of the sheet no other outcrop has been found.

The higher layers of the limestone, lying with glaciated surface beneath the soil cap, are seen in the old Giddings quarry, now known as the Bacon quarry just to the east of the edge of the map.

In general it may be said that this formation forms the most important repository of valuable building material within the region covered by the map, and furthermore in the harder chert layers is a convenient and inexhaustible source of road material not inferior in quality to the field stone that has been generally utilized in the county in recently constructed roads.

Marcellus shale

The term Marcellus shale has been generally applied in New York geology to a black and dark blue shale formation lying immediately on the Onondaga limestone. The lower boundary of the formation is always perfectly clear but not so with the upper, for the mass passes gradually into the lighter gray shales of the Hamilton group above. At Marcellus village, Onondaga co., from which place the name is derived, only the lower layers of this black shale are well exposed and our observations both in that region and thence westward indicate the desirability of restricting the term Marcellus to these lower shales, which are typically exemplified in the original locality but are better delimited upward in Ontario county by the presence here of a limestone cap—the Stafford limestone. Using the term in this restricted sense the Onondaga limestone is overlain everywhere by black slaty shale with a few thin calcareous layers and rows of spheric calcareous concretions. The shales are highly impervious and argillaceous and withstand exposure so well that their outcrops are usually vertical or overhanging cliffs in a

region where there has been but little deep stream-cutting. Owing to their rigidity they are highly jointed and rhomboidal, triangular and diamond-shaped slabs being characteristic of all surface exposures. It is difficult to estimate the thickness of this bed but it appears, from comparison of outcrops here with the total thickness afforded by the Livonia salt shaft section where it was 43 feet with a slight tendency to increase eastward, to be about 50 feet. The actual contact of these beds with the underlying Onondaga limestone has not been observed, but the lowest outcrop of the formation on this quadrangle appears on the west side of the fill on the New York Central Railroad, just north of the cut near Padelford. The higher beds are well exposed in this same cut where they are densely black shales with some thin limestone layers. The same beds appear along Mud creek about a mile south of Mertensia.

The distinctive character of this shale as an initial part of the beds which have heretofore generally been assigned to the Marcellus stage, is its uniformly bituminous nature and consequent dark color and its very small proportion of lime content except in the thin calcareous beds themselves.

Stafford limestone

The group of strata which have customarily been incorporated within the general term Marcellus shale embraced an interesting limestone layer, the presence of which was early noted by Professor Hall and which was termed by the writer some years ago *Stafford limestone*, on account of its high development at Stafford in Genesee county. This is a dark chocolate and somewhat nodular limestone, very hard when fresh but breaking easily into angular fragments on exposure. We have shown in various publications that this formation extends eastward with a diminishing thickness and we know that its last surface appearance is along Flint creek in the southwestern part of the town of Phelps, Ontario co. Though not exposed to the eastward it is evident that the formation in slight thickness (it has a thickness of about 8 inches in Phelps) occurs as a thinning wedge through this area,

for the very characteristic blocks of this rock are quite freely scattered south of the line of outcrop and specially in the east bank of Mud creek. Two miles south of Mertensia the blocks are so common and in such a condition as to indicate very slight removal from place.

Cardiff shale

The upper beds, heretofore generally included in the old term Marcellus and termed by Vanuxem the "Upper shales of Marcellus" are finely shown in and about the village of Cardiff, Onondaga co. As we have restricted the former term, it seems best to adopt for the succeeding layers a name derived from these excellent exposures near the typical region, as in Ontario county they are nowhere seen to so good advantage.

The Stafford limestone is overlain by a series of dark calcareous and black slaty shales with thin layers of fossiliferous limestone. Both limestone and shales weather to a light ashen gray on long exposure. So far as the fossil contents are concerned they are not essentially unlike those of the darker shales below but the gray aspect of the beds and their much higher calcareous content indicate a distinctive difference, which is readily marked throughout this region. Outcrops of these layers are again very few. The best of them is in the bed and sides of Mud creek at its confluence with Shaffer creek in the north-eastern corner of the town of East Bloomfield. They are also exposed in the upper part of the railroad cut section just south of Padelford station. Directly over the line of the quadrangle to the east is an exposure on the east bank of the Canandaigua outlet below Chapinville, and here some of the harder layers were at one time quarried for flagstone and used in the village of Canandaigua but they proved to check very rapidly under exposure and wear. For a quarter of a mile this exposure is continued in the bank of the outlet. At no exposure is the entire thickness of this bed revealed. The heaviest mass of material shown at any one place is in the section on Flint creek just south of Phelps, Ontario co., where there lie on top of the Stafford limestone about 50 feet of these shales, the cal-

careous material increasing toward the top though the dark shales predominate throughout. The gradual increment of lime content makes the passage from this bed into that following essentially imperceptible, but there are accompanying notable distinctions in the composition of the fauna. Taking into account a proper allowance for dip it is estimated that the thickness of the Cardiff shales is here about 100 feet.

Skaneateles shale

This term was applied by Vanuxem to the beds immediately overlying the upper Marcellus, and exposed on both sides of Skaneateles lake at the north end. They are evidently continuous into the Canandaigua area without essential contraction or change and hence the early term is now employed for them rather than the designation Shaffer shale incidentally used in a recent tabulation of these formations. With the increase in calcareous matter the shales become hard, blue black, in places quite black, passing into light and softer beds above with layers of soft impure limestone. For a thickness of 125 feet this shale bed keeps its distinctive characters across the Canandaigua sheet though the distinction is based on comparatively few exposures. These deposits are exposed in the bed of Mud creek south of the highway bridge near the junction of Shaffer creek, $\frac{1}{2}$ mile north of Wheeler and also along Shaffer creek at $\frac{1}{2}$ to $\frac{3}{4}$ mile south of Wheeler. A slight exposure of the black shales is also shown in a small drainage section just below the Robertson quarry adjoining the New York Central Railroad on Fort hill in the eastern part of the village of Canandaigua. They are shown in nearly full strength in Miles gully in the town of Hopewell, just east of the east line of the quadrangle.

Canandaigua shale

Including the Centerfield limestone at the base

Two terms which have become ingrained by long usage in the nomenclature are the *Hamilton group* and the *Ludlowville shales*. The former, introduced by Vanuxem in 1840, was at no time em-

ployed by the original state geologists in any other form and it is evident that the significance here of the term *group* is its reference to the variability of the strata in the typical Madison county sections where they are sandstones, arenaceous and argillaceous shales, not a composition of defined lithologic units. In other words the term is used with the same breadth of meaning as other unit terms of the series and not as the word was subsequently employed in the final reports of the geologists nor in the widely different sense made use of by Dana and generally current. The division was clearly defined and its place in the series is precisely that ascribed to the Ludlowville shales in the Cayuga lake section as was defined by Hall in 1839. Ludlowville was not altogether well chosen as exemplifying the latter division, for the Tully limestone is present in the village and the Moscow shales beneath; one must go afield to find the true Ludlowville strata, but it is evident that Professor Hall's conviction at that early day that these were the representatives of the Ludlow shales of England, influenced his choice of name. We would reject neither name in favor of the other. Each expresses essentially the same interval but a differing series of sediments and some marked distinction in fauna. Each will be found to have a definite meridional value. Hence further west and in the area here under consideration we find still other differences expressed in this interval both lithologic and faunal and are constrained to express these by the terms employed above.

The Canandaigua shale is constituted of soft, dark bluish and gray calcareous shales with impure limestone beds at the bottom, and irregularly nodular calcareous beds abounding in corals toward the middle of the formation. This is a highly fossiliferous mass and its distinction from the beds beneath lies not alone in the nature of its lithologic character, but essentially in the abrupt manifestation of the highly profuse and typical Hamilton fauna. The Skaneateles and Cardiff shales have been regarded as a kind of transition deposit from the typical bituminous Marcellus shales indicating the gradual approach and encroachment of normal Hamilton

conditions together with the advance of the Hamilton fauna. The estimated thickness of the Canandaigua shale is about 125 feet. It is excellently exposed along Shaffer creek immediately south of the exposure referred to above and about a mile north of the village of Centerfield. At this locality the lower calcareous layers and the shale overlain by the coral beds are admirably exposed and have been a most prolific source of fine fossils. These beds also appear within the village of Canandaigua, there being exposures of the impure calcareous beds on east Gibson street at the now abandoned Maggs quarry and also in the more recently opened quarry on the Robertson property south of the Chapinville road. Here the beds, when fresh, are a fairly compact limestone but their schistose character soon checks them on exposure, and they have never proved a satisfactory construction stone. They are however enormously prolific in corals and represent the coral reef better exposed on Shaffer creek. It is probable that beneath them lie the shaly beds, but the limestones which lie near the bottom on Shaffer creek and which are of more compact character, though somewhat more argillaceous in composition, may prove to be absent here. Below the Robertson quarry, to the New York Central Railroad tracks, is a small drainage way which gives indications of the underlying beds down to the blue black Skaneateles shale. The exposure however is not sufficiently clear to demonstrate the presence of the limestone beds referred to. If they are here they would serve as a more substantial building stone for rough purposes such as foundations and cellar walls, than the stone above, that is now or has been worked for this purpose. These lower limestones, which are specially characterized by their fossil contents and have produced some species which have not been found elsewhere, have been designated in a subsidiary sense as the Centerfield limestone.

The upper beds of the Canandaigua shale outcrop on the east shore of Canandaigua lake at Cottage City and in the ravine of Gage's creek and Deep run. On the west side of the lake the shale beds are well shown in the cliffs between Tichenor and Men-

teth points below the Tichenor limestone, and from Tichenor point northward there are several small outcrops along the side hill as far as Hope point and over the region to the westward; lying just at the lower declivity of the rise of land the rock appears where the drift mantle is thin.

This mass of sediments is probably equivalent in part to the *Ludlowville shales* of Hall, but at Ludlowville a limestone called by Hall the *Encrinal limestone* was taken as a line of division between the shale masses, the upper being called the Moscow and the lower the Ludlowville. It is yet to be determined whether that Encrinal limestone is continuous with the Encrinal or Tichenor limestone of the section under consideration and for the present we can not employ here the name Ludlowville with entire security. Hence the term Canandaigua shale is employed on behalf of more accurate, though perhaps provisional expression.

Tichenor limestone

This name is applied to a compact layer of hard bluish gray often crinoidal limestone which has a thickness of about 1 foot. It is separately designated for the reason that it is a continuous formation across this area and well to the east and west beyond it. It contains some of the characteristic fossils of the rock but they are not specially abundant and are frequently replaced by depositions of strontianite. This rock has been commonly known as the Encrinal limestone, a name applied to it by Hall as long ago as 1839 and has been used by many writers in application to limestone layers lying at actually distinct horizons in these rocks, specially from the meridian here under consideration to Lake Erie. On comparison of this section with that on Cayuga lake where the Ludlowville shales were originally defined and the typical exposure of the Encrinal limestone was located, it was found that there is no concurrence in the horizons indicated there and here by the same term. In view of the various limestone strata that have been referred to under this name and its extraordinarily frequent employment throughout all geologic formations with a great variety of stratigraphic meanings, it is best to abandon the

term altogether. At Tichenor point the limestone is exposed along the roadside at the opening of the ravine and it reappears on the shore of the lake just south of Tichenor point where it forms a low but well marked anticline cut off at one end by a slight displacement. Here it dips under the water and reappears at the north side of Menteth point forming a broad platform at the water level.

These are the best outcrops of the formation known in Ontario county and the rock also appears slightly in the lower part of the Miles gully in Hopewell and on Flint creek south of Castleton. A limestone of similar character is exposed in the bed of Beebe brook, West Bloomfield, but it is not altogether certain that it belongs to this horizon.

Moscow shale

The Tichenor limestone is overlain by a mass of mostly soft, light bluish gray calcareous shales, becoming darker toward the upper part. Thin layers of limestone usually extending but a few rods and irregular calcareous lenses largely composed of fossils are of frequent occurrence. At the base of the mass lying immediately on the Tichenor limestone the shale is very compact and highly calcareous and breaks out in irregular slabs. This portion of the deposit is very persistent over a wide area and is characterized by the abundance of crinoids which it contains in the most admirable preservation. Indeed this is the horizon which has furnished all the superior crinoid material from these rocks in this part of the State. It is this layer, which with the Tichenor limestone has in previous reports, specially the description of the geology of Ontario county published by the writer, been designated as the Encrinal band. An exposure of this layer on the farm of Mr Sisson, not far from the village of Muttonville, now Vincent, in the northern part of the town of Bristol, afforded to the collectors of the State Museum in 1860, C. A. White and C. Van Deloo, an immense amount of fine material, constituting the best preserved and most complete series of crinoid calyxes ever obtained from the rocks of this State. This exposure is

no longer accessible and appears to have been overgrown by vegetation with the drying up of the brook. Seventy-five feet above the Tichenor limestone is another limestone layer lying in the midst of this shale mass. This is here designated as the

Menteth limestone, and is worthy of special remark for several reasons. It is a well defined bench mark in these **Moscow shales** entirely across the map. As a rock it is a compact layer about a foot in thickness and usually very pure but in places it proves to be quite argillaceous and nodular. It is a notable repository of the fossils of the fauna and these are very frequently replaced by silica with a degree of delicacy and perfection seldom equaled; perhaps not elsewhere in the paleozoic rocks of the State nor in rocks of ancient date from any locality known to the writer is this replacement so satisfactory to the student of the biologic problems of paleontology. The etching of the purer part of this layer has afforded a most beautiful series of the species of the fauna and as these are retained not alone in adult condition but from the earliest shell-bearing stage on, the material has already been the subject-matter of several important treatises on phylogeny, ontogeny and the systematics of different groups of organisms. We may refer to the papers of Beecher on the trilobites and on certain of the corals, to Grabau's investigation of the corals, to the writer's publications on some of the brachiopods, etc. An indication of the delicacy of these replacements is afforded by some of the shells of the brachiopod *Productella* in which the hairlike spines on the body of the shell projecting for a length greater than the diameter of the shell itself, are preserved without defect. This **Menteth limestone** forms the first falls in the ravine at Tichenor point and also in that at **Menteth point**. It and the shales beneath are well exposed in these places and the shales themselves specially along the shore of the lake between the two points. On the opposite or east side of the lake both shales and limestone are found in Gage creek and Deep run, and again on the east side from **Menteth point** southward to **Foster point**. Farther north is an exposure of the limestone and some of the underlying shales at **Hope point ravine**.

The upper part of the Moscow shales is exposed on the east side of the lake in the Gage creek ravine where, about 50 feet above the Menteth limestone, a series of nodular layers of limestone 2 feet thick form a low cascade. Also in the ravines of Bennett's landing, Gooding landing, Long point and along the lake road and shore to the Gorham-Middlesex town line. The same series is displayed on the west side of the lake from $\frac{1}{2}$ mile south of Black point northward to Foster point, and in the upper parts of the Menteth, Tichenor and Hope point gullies. They are shown in the bed of Shaffer creek $\frac{1}{2}$ mile north of the Gooding schoolhouse near the western boundary of Canandaigua township and also in the Bristol valley in several small ravines on the east side between South Bloomfield and Vincent, and in the lower part of the ravine on the east side of Baptist hill.

Tully limestone

Ontario county includes the westernmost and final appearance of this important, though relatively thin, rock formation. In the towns of Geneva and Seneca to the east and also in Gorham, except close on the shore of the lake, this limestone appears with constantly diminishing thickness, and its last appearance is in Gage creek about 40 rods east of the eastern boundary of the map. Here it is a bed of dark bluish gray, hard, brittle limestone and at its last exposure attains a thickness of 2 feet and 8 inches. Doubtless the stratum extends a mile or more beyond this point to the southwest, as some loose blocks 8 inches thick, apparently but slightly displaced, lie in the bottom of the small gully at the side of the road leading eastward up the hill from Bennett's landing. Eastward of this region and throughout central New York as far as Chenango county the Tully limestone is prominently developed and attains at its maximum a thickness of from 20 to 30 feet. On the Canandaigua sheet at all other exposures except those mentioned, the Moscow shales beneath and the Gorham shales above are in contact or separated by lenticular discontinuous layers of iron pyrites from 10 to 50 feet on the edge and 1 to 4 inches in thickness, the material of which is very hard and in damp places is

not affected by exposure but in cliff faces is usually disintegrated. This singular deposit is exposed in the ravines on the east side of the lake from Gooding landing southward to Fishers and in the shore cliffs to the Gorham-Middlesex boundary. On the west side from just south of Black point along the shore and northward in ravines at Grange landing, Victoria glen, Foster point and Men-teth point; also following the Moscow shales in the localities in the Bristol valley already cited. This layer of iron pyrites is continuous from this region westward to Lake Erie and indicates with striking persistence the horizon of the Tully limestone as a plane of division between the Hamilton group of formations beneath and the Genesee above.

The Tully limestone itself as exposed in Ontario county localities to the east is a very dark bluish gray rock weathering at first to lighter shades of blue and after long exposure to an ashen gray.

It is in two or three layers that are very hard and apparently compact when freshly quarried. On exposure the rock checks along irregular seams and develops a tendency to split into irregular angular fragments an inch or two in diameter. It has been used for construction stone and at one time was burned for quicklime near the village of Gorham. On Fish creek $1\frac{1}{2}$ miles directly east of Reed Corners, where the highway crosses a small brook, is an exposure showing 4 feet and 2 inches of the limestone, and this exposure seems to have been noted in the report by Professor Hall on the geology of this region in 1843, then regarded as the most westerly appearance of the rock. A more extensive exposure is shown however on lot 53, 1 mile southwest of Reed Corners where the north and south "middle road" crosses a small brook flowing west into Canandaigua lake from a ravine about 40 feet deep and 50 rods long above the highway. Here the limestone forms a floor in the ravine for 2 rods and produces a cascade 8 feet high. The exposure continues for 10 to 12 rods on both sides of the gully and at the cascade the total thickness is 5 feet, 10 inches. Still another outcrop is found 2 miles south of the latter on the lake road from Rushville to Canandaigua near the residence of Mr Merritt Cole. This is the outcrop referred to as being near the

eastern limit of this map and here the exposure shows not only the black Gorham shales above but the soft Moscow shales beneath. It is separated by a thin shaly seam into two layers, and in the lower layer iron pyrites is highly abundant in nodules, probably representing the commencement of the pyrites layer, which from here westward is the sole representative of this formation. The place of the Tully where the limestone is wanting and the pyrite layer not clearly apparent is always well defined by the sharp line of contrast between the gray Moscow shales beneath and the overlying black Gorham shales.

The Tully limestone, as has been recognized since the observations by Conrad in 1836-37, is distinguished by the presence of the species *Rhynchonella* or *Hypothyris cuboides* and the equivalency of this geologic horizon with the *Cuboides* zone of Europe has been a fact of general recognition for more than half a century. This fossil is very abundant in the outcrops in Ontario county but the rest of the fauna is essentially that of the underlying beds of the Hamilton group, specially the Moscow shale. We shall presently note in more detail that the fossils contained in the pyrite layer have all been singularly dwarfed by the unfavorable conditions of growth and are regarded as representing stages of arrested development of Hamilton species, the characteristic *Hypothyris cuboides* not having been found therein.

Genesee shale

This term was originally applied by Hall to a division on the Genesee river section consisting of very dark bituminous beds at the base becoming lighter colored and more sandy upward. The highly bituminous beds are distinctly defined by their character and their definition at the top by the Genundewa limestone. It was clearly this excessively black mass of shale that it was intended to distinguish by the name Genesee and as it is now important to refine the subdivision of this series of sediments for more exact correlation, it is here proposed to restrict the term Genesee to this lower member only.

Directly over the Tully limestone, or its horizon when absent, lies a mass of densely black bituminous shale becoming very

fissile on exposure and splitting into large flat plates. Owing to their rigidity these shales are traversed by parallel series of joints intersecting each other at different angles and producing in cliff exposures striking masonry effects like buttresses and bastions and on the surface of horizontal exposure equally striking tessellations, triangles, rhomboids, diamonds and kindred forms. Intermingled with these beds are well defined horizontal rows of calcareous concretions. Occasionally a thin plate of limestone is shown. The beds also contain iron pyrites in nodules and nodular layers. This mass at once recognized by its structural characters as indicated has a thickness of 95 feet and is terminated by the *Styliola* limestone or as here designated, the Genundewa limestone. All these shales are extremely sparse in fossils, more highly bituminous beds showing remains of plants and Conodont teeth, and where the beds become a little bluer and slightly calcareous are *Lingulas* and *Orbiculoideas* with *Pterochaenia fragilis*.

These strata are finely exposed all through the upper parts of the ravines on the east side of the lake from Gooding landing southward to Fishers and in the shore cliffs to Genundewa which lies at the base of Bare hill as it is termed on the map; on the opposite side of the lake in the shore cliffs from Hicks point northward to Black point, and in the lower part of the ravine at Seneca point and the upper parts of ravines back of Grange landing, Victoria glen and Foster point, and throughout most of the rock section in the Menteth ravine back of the village of Cheshire. In the Bristol valley the upper parts of all the ravines heretofore mentioned from South Bloomfield to Vincent and also at Baptist hill show these rocks. They appear as far north as the upper reaches of Shaffer creek near the western town line of Canandaigua, and west to Baptist hill along the valley of Beebe brook.

Genundewa limestone

A dark gray limestone in layers of from 2 to 10 inches in thickness separated by dark or black shale. Some of the layers are even and flaggy, others are concretionary and nodular. Where purest the limestone is almost wholly composed of the shells of

Styliola (*Styliolina*) *fissurella* and from that fact has taken the name of *Styliola limestone*, by which it has been generally known. The horizon is well marked and divides the mass of Genesee deposits into nearly equal parts in this section. It is a persistent stratum and has been traced to the east as far as Seneca lake and westward to Lake Erie. The character of this rock is well displayed at the typical outcrop on the shore of the lake at the foot of Bare hill or, as it should be termed, Genundewa. Here it consists of three layers of rather soft and slightly shaly limestone, the rock being impregnated throughout with myriads of the shells of *Styliola*; is highly bituminous and hence very dark when fresh. The lowest of these layers is 8 inches thick, the second, 7 feet higher, is 6 inches and the third, 6 feet above, 10 inches, making the total thickness of the entire band including the intervening shales, 15 feet. These layers increase in thickness westward, become less shaly and more nodular, and are eventually consolidated. On account of the durability of this rock it is a permanent feature in all exposures of this horizon and as its peculiar character makes them easily recognizable the Genundewa limestone is important as a stratigraphic bench mark. The rock is of singular interest from a paleontologic point of view as will be noticed hereafter. Its calcareous nature being largely due to fossil remains it has afforded a fauna of considerable scope. We find the best exposures of this limestone in the county in the cliffs north of Hicks point and in the Seneca point ravine where it produces the first cascade, also in the Victoria glen and Foster ravine and on the south branch of the Menteth brook where it produced the high cascade $\frac{3}{4}$ mile south of Cheshire. The point last named is the spot at which the rock was originally located by the writer, though specimens from it had been generally known to students for some time before. It is also displayed admirably at the mouth of the Wilder ravine at Bristol Center and in the ravine on the opposite side of the Bristol valley. In Mill creek or Mill gull in the town of Richmond there is an exposure several rods long in the bed of the stream and the limestones are well developed and highly fossiliferous.

West River shale

Fine, blue black or dark gray shales with thin bands of black slaty shale at intervals of 2 to 6 feet. Spheric or oblong concretions are common, occurring singly or in rows. A few thin, sandy flags occur in the upper part of the beds. These shales are contrasted with the Genesee shale below by their lighter shade and their much less bituminous character, for the most part being highly fissile and breaking out into thin, sharp but small laminae. The lighter parts of the mass are easily eroded, being tenuous and clayey and the streams that flow down the hillside have cut numberless narrow, deep gullies in them, the sides of which are steep slopes of slippery shale. The concretions in the shale are frequently highly characteristic and are the source of most of the very abundant specimens of these bodies which are found scattered over the region and have been collected by the residents on account of their curious forms, suggestive of turtles, human skulls, hats and various other rounded objects. They not infrequently carry fossils in much better condition than found elsewhere in the beds, and these fossils of the concretions are more in accord with the singular fauna of the Genundewa limestone than are those of the shales. In the shales organic remains are of more frequent occurrence than in the Genesee shales beneath but they are seldom abundant.

This rock is shown in the lower part of all the ravines in the Middlesex valley north of the Goodrich gully. There is also a small outcrop by the roadside half a mile north of Rushville and along several small brooks in the southwest part of the town of Gorham. In the Snyder gully just above Woodville at the head of Canandaigua lake they are well shown, and also in the lake cliff at Woodville where their peculiar blocky structure, due to numerous joints, is finely displayed. The deeper parts of the ravines at Coye, Granger, Lapham, Cook and Hicks points and all of the other gullies between the head of the lake and Seneca point are in these shales; also the Seneca point ravine above the first cascade and the upper part of Victoria glen and Foster gully. Northerly exposures are also shown in

the bed of the creek at Cheshire. They enter largely into the composition of the lake wall on the east side from Genundewa south to Woodville, but here the rock exposures are extensively overgrown. In the Bristol valley they are displayed in the large ravine of Wilder creek and from there southward in the Reed and Packard ravines and in several other smaller gullies on both sides of the valley. The south branch of Beebe brook in the northwest corner of Bristol township flows through a small gully cut in the shales of this horizon, and in the town of Richmond the rocks are exposed in the cliffs of Mill gull. Here, a short distance above the outcrop of Genundewa limestone, the cliff walls are handsomely banded by alternating layers of black beds recurring among the blue gray layers.

Standish flags and shales

Thin, uneven, bluish gray flags and olive shales. This is a thin bed of rocks probably not exceeding 15 feet in thickness, but it has seemed entitled to distinctive designation because it marks a transition from the argillaceous shales of the West River beds into the arenaceous sedimentation, characterizing for the most part, the mass of the Portage strata. The beds were originally designated by the writer "transition shales" in recognition of the fact referred to. It is not a persistent deposit for any great distance from the region immediately under consideration. The mass, thinning out toward the west, disappears altogether in the Genesee valley and by its absence the overlying bed of black shales (Middlesex shales) is brought directly on the West River beds. The beds show some difference from those below in faunal content. Exposures are seen in the localities already mentioned where the outcrops are sufficiently continuous, specially in the Middlesex valley in the ravine 50 rods north of the Lee schoolhouse and in other ravines at the north to Middlesex Center, and on the west side of the valley in the Goodrich gully running up into South hill and ravines to the north; in the Canandaigua lake valley, in the Standish gully and the ravines from Woodville to Cook point, and in the upper

reaches of the ravines farther north; in Bristol hollow near the lower part of the Randall gully and also in the Reed and Wilder ravines.

Middlesex black shale

It has been customary to regard the Genesee group of strata as closing with the foregoing and to place the Middlesex shale at the base of the Portage series. This Middlesex shale is a very black, somewhat slaty shale with thin arenaceous gray flags in the upper and lower portions. When Professor Hall introduced the designation Genesee shale for the black shales in the Genesee river section, he expressed the opinion that eventually it might be found advisable to include them within the limits of the Portage formation. We have shown that on paleontologic grounds this is necessary, and it is clearly apparent that the geologic character of the deposit shows that the Genesee black shales are but an introductory phase of Portage sedimentation repeated in the Middlesex and Rhinestreet bands. The Middlesex shale attains a thickness of 35 feet where fully exposed in the Middlesex valley and decreases westward to 25 feet in the valley of Honeoye lake, just beyond the west line of these maps.

Fossils are of great rarity. Plant remains occur in the shales, and these have also afforded a single specimen of the goniatite *Sandbergeroceras syngonum*. Occasionally a characteristic lamellibranch of the Cashaqua shales above appears in the gray flags of the lower beds. This mass of black shale is continuous westward to Lake Erie but it decreases gradually in thickness till on the Lake Erie shore at the mouth of Pike creek there are but about 6 feet of it remaining. The rock is well exposed in the Middlesex valley in most of the ravines between the Lee schoolhouse and the village of Middlesex. It is seen on the roadside on the east side of the swamp at the head of the lake and in the Canandaigua lake valley by the road $1\frac{1}{2}$ miles south of Woodville, also on the road leading west at the head of the lake and in the Standish, Coxe, Granger, Lapham, Cook, Hicks point and Seneca point ravines, by the side of the Academy road 1 mile south of Cheshire. In the Bristol valley it may be observed in

all the ravines already mentioned and in the Hamilton gully, Mill gull and Jason gull in the valley of Honeoye lake.

Cashaqua shale

This name was introduced by Professor Hall for the characteristic olive gray shales with occasional flags and sandstone as developed along the Cashaqua creek, a confluent of the Genesee river. As these beds are continuous from that point eastward to the area under consideration the term is completely applicable here. In this area this mass of shales attains a thickness of about 230 feet, and is mostly bluish gray and olive shale with a few thin dark layers and with two bands of thin sandstone and numerous flags in the lower part. Calcareous concretions and discontinuous concretionary layers occur in the upper part. As a whole the deposit in Ontario county is more arenaceous and less calcareous than that in the Genesee river section. In the lower 75 feet the more sandy beds are rarely fossiliferous, showing occasional lignites and frequently the object termed *Fucoides graphicus*. At about the middle of the series the shales become softer, and here the characteristic fauna of these Portage rocks is typically developed with numerous goniatites, Bactrites and lamellibranchs of the genera *Buchiola*, *Lunulicardium*, *Ontaria* etc. The character of this fauna is referred to in a subsequent paragraph. Above these more highly fossiliferous beds is a band of compact sandstone and hard shales which is succeeded by 57 feet of soft, blue and olive clay shales, characterized by nodular structure due to irregular concretions of lime carbonate of small size. Six feet above the sandstone is a singular concretionary limestone which is continuous in character, attains a thickness of about 6 inches and is a mass of red and greenish kramenzel abounding in goniatites and *Orthoceras*. This layer is so distinctive, both on account of its color, its contents and its composition that it is here designated as the

Parrish limestone. It appears first on the western boundary of the Naples valley and is continuous from there eastward as far as Big stream and Glen Eldredge on Seneca lake. Its place in

the succession is apparently indicated in the western part of the quadrangle by a row of fossiliferous spheric concretions which appear in the Bristol and Honeoye valleys.

The Cashaqua shale, flags and calcareous beds constitute the principal situs of the fauna of the rocks and their exposures can be studied to best advantage in the admirable outcrops on the east side of the Naples valley, specially in the great Parrish gully at Parrish, the Caulkins gully and other small ravines cutting back into Hatch hill. The rocks are also shown in the face of Hatch hill behind the fair-ground and southward. The west side of this valley also affords some admirable exposures as in the Lincoln gully and thence northward on the western slope of Canandaigua lake in scores of ravines and gullies and along the dugway roads as far north as Cheshire. They are also displayed in the upper parts of all the gullies in Bristol Center southward to nearly the end of the valley and along Egypt brook and its various branches in South Bristol and also in the upper part of Jason gull. In the Honeoye lake valley the decreasing proportion of the arenaceous layers toward the west is noticeable, the shales becoming more calcareous and concretionary. The Briggs and Hamilton gullies near the west line of the map in the Honeoye valley afford particularly favorable outcrops for study. Nearly all the Cashaqua shales are to be seen under specially favorable conditions along the Whetstone brook west of Honeoye village from the Livonia road to the falls at the Devil's Bedroom. Eastward of Naples they are found in Italy hollow at the mouth of the ravine which crosses the road at the Big Tree schoolhouse. In the Middlesex valley they are well seen in the Clark and Mower gullies and also in the Lee, Goodrich and other small ravines farther north toward Middlesex Center. In fact in these high lands of the southern part of the map wherever the relatively thin drift mantle has been transected by streams these beds are brought to light.

Rhinestreet black shale

Black slaty shale with a small proportion of blue shale and occasionally thin but lenticular sandstones. Thickness 18 feet on the eastern boundary of the quadrangle increasing to 30 feet at

the western. This tendency to increase westward is manifested beyond the area of the map, for we find the bed to be continuous from here to Lake Erie, where its thickness is more than 200 feet. It may be traced eastward to Seneca lake, where its thickness is but 1 foot.

The rock is essentially devoid of organic remains with the exception of fragments of plants, specimens of *Spathiocaris*, teeth of *Conodonts* and a few small *Lingulas*. These rocks are to be seen in Italy hollow in the ravine already referred to near the Big Tree schoolhouse, in the Naples valley at the foot of Hatch hill near the salt well, on both sides of the Naples and Middlesex valleys to Middlesex Center, and on the north side of Genundewa. The formation takes its name from the exposure on the road running from Naples to Seaman hill, on the west side, which is known locally as Rhinestreet and along which there are constant exposures of this formation. They may be seen also in the upper part of all the large ravines on the west side of Canandaigua lake to the iron bridge over the Foster gully, 2 miles south of Cheshire; in the Bristol valley in the ravines on both sides as far north as Bristol Center and about $\frac{1}{2}$ mile north of Boswells Corners; in the Honeoye valley in all the ravines between the Hancock farm and the foot of the lake.

Hatch shale and flags

Blue and olive shales with frequent thin layers of black shale and thin sandstones. The sandstones become more frequent and thicker in the upper part of the formation; the lower layers carry very symmetric calcareous concretions from 2 inches to 2 feet in diameter. This mass immediately overlying the Rhinestreet black shales, or the *second black band* of some of our reports, attains a thickness of 290 feet and its resistant character, due to the presence of many layers of hard sandstone and flags, is the fundamental cause of the highlands on the Naples quadrangle. These beds are equivalent in part to the Gardeau beds of Hall in the Genesee valley section, but there are reasons for not applying the latter term in the Naples meridian as it can not be employed with exactitude.

These upper beds occasionally carry the fossils of the Cashaqua shale, but in no place are they of frequent occurrence except occasionally in replaced condition in the calcareous concretions. Toward the more sandy middle and upper portions of the series plant remains are not infrequent and from these beds has been obtained a *Lepidodendron* of commanding proportions, taken from a horizon at the mouth of Grimes gully, Naples, 74 feet above the Rhinestreet shales. The specimen when taken out measured 15 feet in length from the root upward.

Exposures of these beds are found throughout the Naples valley and constitute the entire lower part of Hatch hill, in the Tannery gully just south of Naples and in the Grimes gully on the west side, also in the higher parts of the Caulkins, Parrish, Hoecker and Lincoln gullies and in all accessible ravines of the Naples and southern parts of the Middlesex valley. Along Canandaigua lake they are seen in the upper parts of the deeper ravines on the west side, south of the Academy tract, in Bristol valley in the upper parts of all the ravines between Boswells Corners and Bristol Center and in the Honeoye valley just west of the sheet between Hunts hollow and the Briggs gully.

Grimes sandstone

Compact or laminated, light bluish gray sandstones in layers 4 inches to 3 feet thick, separated by hard, blue gray shales. In the vicinity of the Tannery gully, $\frac{1}{2}$ mile south of the village of Naples, a part of the sandstone is highly calcareous owing to the presence of masses of molluscan shells, mostly in comminuted condition. Thickness about 50 feet. In the face of the precipice at the third falls of the Grimes gully and exposed in the escarpment on the east side of the ravine 10 feet above the water, is a thin layer of soft shale which has been found to contain *Buchiola retrostriata*, *Manticoceras pattersoni*, *Bactrites* and other typical members of the Naples fauna. This is its highest appearance in this section. Twenty-four feet higher and 9 feet below the crest of the falls occurs the Grimes sandstone which bears a brachiopod fauna with *Liorhynchus*, *Atrypa reticularis*, *Productella*,

Ambocoelia, *Leptostrophia mucronata*, etc.; the first appearance of this fauna in this section and to be regarded as an incursive appearance of the Ithaca fauna lying farther to the east. This formation lies 599 feet above the base of the Middlesex black shale and this is the thickness to be ascribed to the Portage formation in this meridian as formerly defined. In the Tannery gully on the east side of the Naples valley the upper beds have afforded a number of singular organisms associated together but not concurring with species of the characteristic Naples fauna. These are specially noted elsewhere and consist of the fossil *Paropsonema*, believed to be an aberrant echinoid, some forms of annelids described as *Protonympha* and *Palaeochaeta*, also a large *Orbiculoidea*, some strange and undescribed linguloids, etc. The division occurs also at the Naples reservoir, in the escarpment on Hatch hill, in the Caulkins gully and the quarry near it, at the top of the dugway on the Hunts hollow road, in the road near Freeds and along the hillside northward to Rhinestreet, also near the Muck place on Seaman hill and in the small ravine near the Gardner property, 2 miles north of Bristol Springs. In Bristol hollow it appears in the upper parts of the Randall and Reed gullies and on the north side of Worden hill; in the Honeoye valley on the hillside above E. Alger's property and northward to the upper part of the Briggs gully.

West Hill flags and shale

Light bluish gray sandstones or flags from 2 to 12 inches thick, separated by beds of dark blue, olive or black shale. The sandstones are sometimes quite calcareous owing to the presence of crinoid stems and other fossils usually in fragmentary condition. Thickness 550 feet. This heavy mass of arenaceous deposits like the Hatch beds below is partially equivalent to the Gardeau series of Hall as developed in the Genesee valley. It has however undergone a change faunistically, and remains of the Naples fauna are now no longer seen, though the rocks contain fossils in some measure; but these are largely brachiopodous and indicate continued presence of the Ithaca fauna. The sandstones are

quite sharply distinguished from the Grimes sandstones below on account of their thinner bedding and bluish color. This division is exposed in Italy hollow at the south end along Flint creek and in the Italy gully, in the Naples valley in the Tannery gully and Grimes gully. It is found on the south side of the road leading easterly across Deyo basin, 2 miles south of Naples, 5 or 6 rods from the Ingleside road and near the foot of the hill. Here it is an isolated exposure and its stratigraphic position can not be ascertained with precision. It is however not far from 100 feet above the top of the Grimes sandstone. At this spot it has produced a number of interesting fossils; *Hydnoceras tuberosum*, *H. variabile*, *Ceratodictya cincta*, *Hysteracanthus*, *Spirifer mesacostalis*, *Atrypa hystrix*, *Productella*, *Ambocoelia* etc. The same horizon is found near the residence of Charles S. Sutton on the north side of the road leading from Naples to West hollow and here also brachiopods are found. The same beds are seen on the lands of the Pottle estate, $1\frac{1}{2}$ miles north of the last named exposure. One of the sandstones here contains fossils in great abundance, principally of the same species as found in the Deyo basin and on the West hollow road. A survival of the Naples fauna is notable here in the presence of the species *Manticoceras oxy*. In the road leading northward on the top of Worden hill a ledge of sandstone is exposed on both sides that contains masses of brachiopods. This locality is about 1 mile north of the south line of Bristol township. On Hatch hill are outcrops in the lower part of the so called Three Cornered clearing near the top. The rocks are also seen at the upper end of the Hoecker and Lincoln gullies and on the hill north of the Seaman schoolhouse, and in many small ravines on the sides of High point, Frost hill and Gannett hill. They are also the surface rock over the principal part of the town of Canadice to the west of the sheet and extend over the tops of the ridges on both sides of the Bristol valley for a mile or two into the town of Bristol.

Highpoint sandstone

Light gray sandstones in layers from 3 inches to 4 feet in thickness separated by thin beds of hard blue shale. Some of the layers of the rock are compact and calcareous but the larger portion is laminated and sometimes shaly. Lenticular beds of impure limestone composed of crinoid stems and other fossils occur at High point and other outcrops. These sandstones are thinner and softer toward the east. Thickness 100 feet. These beds are nowhere sufficiently exposed to admit of detailed examination of the entire series and the upper and lower contact, but 50 to 75 feet of the formation project in the cliff at the south end of High point at an elevation of 1850 to 1925 feet A. T., and the talus that covers the strata at the base of the hill is principally composed of fallen slabs and blocks of the sandstone. In structure, texture and general appearance they differ from the Grimes sandstone only in being somewhat coarser and weathering to a lighter color but they likewise differ notably in their fossil contents. *Fucoides verticalis*, which is not seen in the lower rocks, is common throughout these beds. The most striking feature of this exposure consists of an irregular stratum of calcareous sandstone and conglomerate 7 feet thick where thickest and thinning out gradually around both sides of the hill. This is a mass of brachiopods, corals and crinoid stems cemented into a hard, compact layer that resists the effects of weather and at one place projects 12 feet beyond the soft sandstone beneath it. Several fallen slabs of this calcareous layer 10 to 15 feet across are to be seen at the foot of the escarpment and many others have been broken up and utilized in the construction of fireplaces in the pioneer days and later in the arches of furnaces beneath steam boilers, its resistance to the disintegrating effect of heat making the "High Point freestone" highly esteemed for these purposes in this locality. It has, however, now fallen into disuse. This highly fossiliferous layer is about 50 feet below the top of the sandstone. In it a well defined Chemung fauna with *Spirifer disjunctus* occurs together with species

which were originally described from the upper Devonian beds of Iowa, and attention is here directed to a more complete statement of the fossil contents of these beds in a subsequent paragraph. The rock is not exposed on the south or west sides of the depressions that isolate High point, though calcareous layers of somewhat similar character occur at about the same horizon in the cliff on the northwest end of Knapp hill and also in the escarpment near Mr J. Eldridge's residence on the road from Garlinghouse to Atlanta. Hard, dark shales and thin sandstones come in again at the top of the High point bluff and are slightly exposed in the fields above but no fossils were observed in them and nothing but their position distinguishes them from those below. On the south side of the Naples valley the Highpoint beds appear in some isolated outcrops on the north slope of Pine hill and in the bluff on the west side of Knapp hill and the thick sandstones that form the escarpments above the talus in the vicinity of McClarie's quarry on the dugway road just east of North Cohocton are in the same horizon, but the rock here is almost barren of fossils. They are also to be seen in Lyons hollow by the side of the road leading east, 2 miles south of Ingleside; in the upper part of Italy gully and on the tops of Worden and Gannett hills. Careful stratigraphic work has determined that the Highpoint sandstone is continuous with the original Portage sandstones of the Genesee valley, which in Professor Hall's section capped the Portage section there. It has also been pointed out that while these horizons are stratigraphically continuous the fauna is very different in the two sections. The Portage sandstones still carry the Naples fauna, while in the Naples region that fauna has long before this date been extinguished by the appearance, first of the Ithaca, then of the Chemung fauna from the east.

Prattsburg sandstone and shale

In the lower part of this division the sandstones are mostly olive-gray, rather soft and schistose or in thin even layers, and the shales are in part soft and blocky, similar in appearance to the *Cashagua* shales. Layers of blue, olive and black shales occur.

Thickness from 200 to 225 feet. These beds lie in the horizon of the Wiscoy shales of the Genesee river section, which are beds there overlying the Portage sandstones but still carrying the Portage fauna though somewhat modified in character. There also they are overlain by strata carrying the Chemung fauna which appears first at Long Beards riffs with *Spirifer disjunctus*.

The upper part of the Prattsburg beds in the Naples region are light bluish gray sandstones, usually in lentils and compact or uneven layers. The interstratified shales are mostly blue and hard, but black and slaty layers occur frequently. These beds have a thickness of 300 to 400 feet in the higher land of the southern part of the quadrangle. The lower portion, or the equivalent of the Wiscoy horizon, is exposed in a small outcrop on the road leading from Marsh's Corners southward up Pine hill near the top, and a mile still farther east on the road leading from Ingleside to Lent hill is another exposure in approximately the same horizon, from which *Manticoceras oxy* has been obtained. Whitney's quarry on the southwest side of Pine hill, which has produced a large amount of flagstone laid for sidewalks in the village of Naples and adjoining towns, is in this horizon. It is exposed also along the dugway road leading up Lent hill southwest from Ingleside near the road on the east side of Pine hill, in the Woodworth quarry 2 miles south of North Cohocton, on Lent hill in the ravine west of the Wheaton farm, in the upper part of the Italy gully, and by the roadside 2 miles north of Prattsburg. The upper beds are seen in the Wheaton quarry on the hill south of Atlanta, by the roadside in several places in the vicinity of Lent Hill church and in numerous small outcrops on the high ridge between the Prattsburg valley and Lyons hollow.

SUCCESSION OF FOSSIL FAUNAS

Camillus shale

We know of no traces of organisms in these deposits except an occasional ostracode shell (*Leperditia*) and a trail made on the soft mud by such an organism. The sediments were laid down in a sea too shallow and too strongly saturated with brine and alkalis to encourage the existence of life.

Bertie waterlime

The fauna of these beds is that peculiar association of crustaceans which has made this horizon one of the most interesting in the entire series of the New York formations. Occasionally in the outcrops and more freely in the loose blocks of this rock scattered over the country south of the line of outcrop, are specimens of *Eurypterus remipes* Dekay and *Ceratiocaris acuminata* Hall, with abundant *Leperditias*, *Lingulas* and an occasional *Orbiculoidea*. Westward of this region specially in the exposure in the quarries of the Buffalo Cement Co. at Buffalo, and eastward in the towns of Sauquoit and Litchfield, Herkimer co., these crustaceans with others are found in great abundance and perfection, but in the intervening region they have thus far proved of rarer occurrence. The fauna of these merostome crustaceans is widely known as one marking the closing stages of Siluric time through northern latitudes on both hemispheres.

Cobleskill shale and dolomite

The fauna here is sparse but indicative of the relation of the horizon to its more typical eastward outcrops. The list of species at present known is:

<i>Eurypterus</i> , occasional fragments	<i>Spirifer eriensis</i> Grabau
<i>Leperditia alta</i> Conrad	<i>Cyathophyllum hydraulicum</i> Simpson
<i>L. scalaris</i> Jones	
<i>Whitfieldella sulcata</i> Vanuxem	

Oriskany sandstone

This rock carries no fossils in this district. At Union Springs, Cayuga co. is the nearest point where the characteristic fauna of the arenaceous deposits is developed with *Spirifer are-*

nosus Conrad, *Hipparionyx proximus* Vanuxem, *Meristella lata* Hall, *Chonostrophia complanata* Hall, etc. A few imperfect fossils have been found in the outcrops on Flint creek near Phelps Junction but mostly when the rock takes on the form of a thin quartzite or breccia as here it is devoid of fossils.

Onondaga limestone

Throughout the exposures of this rock fossils are abundant but they are not easily obtained because of the difficulty in setting them free of the matrix. Experience has shown that the endeavor to acquire the remains from the unweathered exposures is for the most part fruitless as well as arduous except where there are shale masses intercalated between the limestone beds. The fauna is specially profuse in corals but the agglomerations of these organisms which are seen in the lower beds of this district become immense coral plantations farther westward in the vicinity of Leroy, Genesee co. Nature has helped to solve the difficulties attending the extraction of these fossils by scattering over the county and through the soil southward innumerable blocks of this rock. The corals are partially silicified in the bed and on exposure become more so and the dissolution of the calcareous matrix makes the occurrence of silicified corals of this formation extremely common over much of the region covered by this map. The layers of the limestone that are associated with and more or less impregnated by the chert, weather into all sorts of irregular shapes according to the degree of dissemination of the lime throughout them and when this silicious rock has become thoroughly "rotten," that is, has lost all its lime, the silicious residuum retains with minutest precision the impressions of the organic contents. By the examination of such masses of rotten stone has the fauna in an important degree been made out, and an illustration of their significance is seen in the fact that these masses from Ontario county produced specimens of trilobites alone of which 55 drawings were made for the monograph of these organisms published as volume 7, *Palaeontology of New York*.

In these weathered blocks students of this fauna will find their material in most suitable form for study; these will not however

contribute to a knowledge of the zonal distribution of the species. Of this condition we know little; probably variations in range are so slight that the effort to ascertain them would produce a result in no way commensurate with the labor involved.

The student may expect to find in the Onondaga limestone of this district the following species:

Fishes

Machaeracanthus peracutus Newberry

M. sulcatus Newberry

Onychodus sigmoides Newberry

Crustaceans

Acidaspis callicera Hall & Clarke

Beyrichia subquadrata Jones

Bollia bilobata Jones

Cyphaspis diadema Hall & Clarke

C. hybrida Hall & Clarke

C. minuscula Hall

C. stephanophora Hall & Clarke

Dalmanites aegeria Hall

D. anchlops Green

D. bifidus Hall

D. calypso Hall

D. coronatus Hall

D. diurus Green

D. myrmecophorus Green

D. pygmaeus Hall & Clarke

D. selenurus Conrad

Eurychilina? reticulata Ulrich

Leperditia cayuga Hall

Lichas contusus Hall & Clarke

L. dracon Hall & Clarke

L. erlops Hall

L. gryps Hall & Clarke

L. hispidus Hall & Clarke

Moorea kirkbyi Jones

Palaeocreusia devonica Clarke

Phacops bombifrons Hall

P. cristata var. plpa Hall & Clarke

Phaethonides gemmaeus Hall & Clarke

P. navicella Hall & Clarke

Primitia clarkel Jones

Proetus clarus Hall

P. crassimarginatus Hall

P. folliceus Hall & Clarke

P. microgemma Hall & Clarke

P. ovifrons Hall & Clarke

P. stenopyge Hall & Clarke

P. verneuili Hall & Clarke

Turrilepas cancellatus Hall & Clarke

T. flexuosus Hall & Clarke

Cephalopods

Cyrtoceras citum Hall

Gomphoceras absens Hall

G. eximium Hall

Gyroceras cyclops Hall

G. lacinosum Hall

G. matheri Conrad

G. trivolve Conrad

G. undulatum Vanuxem

Orthoceras geneva Clarke

O. inoptatum Hall

O. profundum Hall

O. sceptrum Hall

O. thoas Hall

Pteropods

Hyalolithus ceratophilus Clarke

H. ligea Hall

Tentaculites scalariformis Hall

Gastropods

Bellerophon curvilineatus Conrad

B. pelops Hall

Callonema lichas Hall

Diaphorostoma lineatum Conrad

D. turbinatum Hall

D. unsulcatum Conrad

Euomphalus decewi Billings

E. laxus Hall

Loxonema laxum Hall

L. pexatum Hall

L. robustum Hall

L. sicula Hall

Murchisonia intercedens Hall

Naticopsis compacta Hall

*Platyceras ammon Hall**P. argo Hall**P. carinatum Hall**P. concavum Hall**P. crassum Hall**P. cymbium Hall**P. dentalium Hall**P. dumosum Conrad**P. erectum Hall**P. fornicatum Hall**P. nodosum Hall**P. perelegans Hall**P. rectum Hall**P. subrectum Hall**P. undatum Hall**Pleurotomaria adjutor Hall**P. delicatula Hall**P. hebe Hall**P. lucina Hall**P. plena Hall**P. quadrilix Hall**P. unisulcata Conrad**Strophostylus varians Hall**Turbo shumardi de Verneuil**Lamellibranchs**Aviculopecten pectiniformis Conrad**A. ignotus Hall**Conocardium cuneus Conrad**C. trigonale Conrad**Cypricardinia indenta Conrad**Limoptera pauperata Hall**Lyriopecten dardanus Hall**Megambonia cardiiformis Hall**Modiomorpha clarens Hall**Nyassa elliptica Hall**Palaeopinna recurva Hall**Panenka multiradiata Hall**Paracyclas elliptica Hall**Pterinopecten insons Hall**P. undosus Hall**Brachiopods**Amphigenia elongata Hall**Atrypa reticularis Linné**Camarotoechia billingsi Hall**C. inequiplcata Hall**C. royana Hall**C. tethys Billings**Centronella glansfagea Billings**Chonetes acutiradiatus Hall**C. arcuatus Hall**C. lineatus Hall**Chonostrophia reversa Whitfield**Coelospira camilla Hall**Leptaena rhomboidalis Wilckens**Leptocoelia acutiplicata Conrad**Leptostrophia perplana Conrad**Lingula desiderata Hall**Meristella doris Hall**M. nasuta Conrad**M. scitula Hall**Orthothetes pandora Billings**Pentagonia unisulcata Conrad**Pentamerella arata Conrad**Productella navicella Hall**P. shumardiana Hall**Rhipidomella lenticularis Vanuxem**R. semele Hall**Schizophoria propinqua Hall**Spirifer acuminatus Conrad**S. arctosegmentus Hall**S. disparilis Hall**S. divaricatus Hall**S. duodenarius Hall**S. fimbriatus Conrad**S. gregarius Clapp**S. macer Hall**S. macrothyris Hall**S. manni Hall**S. raricosta Conrad**S. varicosus Hall**Stropheodonta ampla Hall**S. concava Hall**S. demissa Conrad**S. hemisphaerica Hall**S. inequiradiata Hall**S. inequistriata Conrad**S. patersoni Hall**S. textilis Hall**Terebratula lens Hall**Crinoids**Codaster pyramidatus Hall**Cyathocrinus bulbosus Hall**Edriocrinus pyriformis Hall**Myrtillocrinus americanus Hall**Corals**Alveolites squamosus Billings**Aulacophyllum princeps Hall**Cladopora cryptodens Billings*

<i>C. laqueata Rominger</i>	<i>F. tuberosus Rominger</i>
<i>C. labiosa Billings</i>	<i>Heliophyllum annulatum Hall</i>
<i>Cyathophyllum corniculum Edwards & Haime</i>	<i>H. cancellatum Hall</i>
<i>C. juvenis Rominger</i>	<i>H. exiguum Billings</i>
<i>C. robustum Hall</i>	<i>Michellinia cylindrica Edwards & Haime</i>
<i>C. validum Hall</i>	<i>Pleurodictyum convexum d'Orbigny</i>
<i>Cylindrophyllum elongatum Simpson</i>	<i>Ptychophyllum striatum Hall</i>
<i>Cystiphyllum scalatum Hall</i>	<i>Syringopora nobilis Billings</i>
<i>C. sulcatum Billings</i>	<i>S. perelegans Billings</i>
<i>Eridophyllum simcoense Billings</i>	<i>Zaphrentis complanata Hall</i>
<i>Favosites canadensis Billings</i>	<i>Z. fastigata Hall</i>
<i>F. emmonsii Rominger</i>	<i>Z. gigantea Edwards & Haime</i>
<i>F. epidermatus Rominger</i>	<i>Z. tabulata Hall</i>
<i>F. hemisphaericus Troost</i>	

Marcellus shale

With the close of the limestone epoch there was an abrupt change in the sedimentation, and here begins a new series of sediments and very distinct aggregate of faunas. The Marcellus shale introduces black, carbonaceous and pyritous sedimentation, evincing a deepening of the waters and a foul bottom, over which but few forms of life prevailed and these depauperated in size and of very tenuous shell. All the species here found are the apparent proper accompaniments of such bionomic conditions; *Liorhynchus limitaris*, which puts in an appearance during this stage of the Devonian wherever the sediments become highly charged with bituminous matter; *Chonetes mucronatus*, *C. lepidus*, *Strophalosia truncata*, *Pleurotomaria rugulata*, *Styliolina fissurella* and *Orthoceras subulatum* also follow these conditions. Occasionally members of the congeries have apparently dropped into the deposits from the higher and more prolific zone of life.

The exposures at Padelford and along Mud creek have furnished the following:

<i>Orthoceras subulatum Hall</i>.....c	<i>C. mucronatus Hall</i>.....r
<i>Styliolina fissurella Hall</i>.....cc	<i>Strophalosia truncata Hall</i>.....cc
<i>Pleurotomaria rugulata Hall</i>.....c	<i>Liorhynchus limitaris Vanuxem</i> ...cc
<i>Nuculites oblongatus Conrad</i>.....c	<i>L. multcosta Hall</i>.....r
<i>Chonetes lepidus Hall</i>.....c	

Stafford limestone

We have shown in papers relating specially to this deposit¹ that its very extensive fauna is that of the Skaneateles, Canandaigua and Moscow shales in unusually favorable development. It was the first appearance in this region of that fauna, but for western New York as a whole, the second invasion of this Hamilton fauna from the west into the Appalachian basin. For a full account of the formation and its contents where best developed, reference is made to the papers cited and to Elvira Wood's discussion of the fauna of the Stafford limestone at Lancaster, Erie co. [Bul. 49, p.139]. The absence of outcrops of the rock over the area of this map restricts the representation of its fauna to such species as are to be found in the loose blocks, but the following is a list of the species which may be expected from the formation.

Undetermined plates and scales of fishes

Worms

Spirorhbs

Crustaceans

Homalonotus dekayi Green

Phacops rana Green

Cryphaeus boothi Green

C. boothi var. calliteles Green

Proetus macrocephalus Hall

Cyphasps craspedota Hall & Clarke

Primitiopsis punctulifera Hall

Cephalopods

Nautilus liratus Hall

N. cf. magister Hall

Nephriticeras bucinum Hall

Orthoceras subulatum Hall

O. aegae Hall

O. marcellense Vanuxem

O. fenestrlatum Clarke

O. staffordense Clarke

O. erlense Hall

Pteropods

Tentaculites gracillistriatus Hall

Styliolina fissurella Hall

Gastropods

Platyceras attenuatum Hall

P. bucculentum Hall

Cyrtolites mitella Hall

Bellerophon lyra Hall

Diaphorostoma lineatum Conrad

Pleurotomaria lucina Hall

P. rugulata Hall

P. itys Hall

P. capillaria Conrad

P. sulcomarginata Conrad

Loxonema hamiltoniae Hall

Onychochilus nitidulus Clarke

Lamellibranchs

Pterinopecten exfoliatus Hall

Actinopteria muricata Hall

Liopteria laevis Hall

Cypricardina indenta Conrad

Panenka mollis var. costata Hall

P. radians Conrad

Pterochaenia fragilis Hall

Brachiopods

Terebratula lincklaeni Hall

Cryptonella planirostris Hall

¹N. Y. State Geol. 8th An. Rep't. 1889. p.60; and N. Y. State Mus. Bul. 49. 1901. p.130.

<i>C. rectirostris</i> Hall	<i>Orthothetes chemungensis</i> Conrad
<i>Camarotoechia sappho</i> Hall	<i>O. arctostriatus</i> Hall
<i>C. horsfordi</i> Hall	<i>Rhipidomella vanuxemi</i> Hall
<i>C. dotis</i> Hall	<i>R. cycias</i> Hall
<i>C. prolifica</i> Hall	<i>Crania crenistriata</i> Hall
<i>C. pauciplicata</i> Wood	<i>C. recta</i> Wood
<i>Spirifer audaculus</i> Conrad	<i>Craniella hamiltoniae</i> Hall
<i>S. fimbriatus</i> Conrad	
<i>S. subumbona</i> Hall	<i>Bryozoans</i>
<i>Ambocoelia nana</i> Grabau	<i>Hederella canadensis</i> Nicholson
<i>Meristella barrisi</i> Hall	<i>H. cirrhosa</i> Hall
<i>Trematospira gibbosa</i> Hall	<i>Reptaria stolonifera</i> Rolle
<i>Strophalosia truncata</i> Hall	<i>Blastoids</i>
<i>Productella spinulicosta</i> Hall	<i>Nucleocrinus lucina</i> Hall
<i>P. shumardiana</i> Hall	
<i>Chonetes mucronatus</i> Hall	<i>Corals</i>
<i>C. scitulus</i> Hall	<i>Favosites placenta</i> Hall
<i>C. lepidus</i> Hall	<i>Stereolasma rectum</i> Hall
<i>Tropidoleptus carinatus</i> Conrad	<i>Striatopora limbata</i> Conrad
<i>Stropheodonta inaequistriata</i> Conrad	<i>Romingeria</i>
<i>Leptostrophia perplana</i> Conrad	<i>Aulopora</i>

Cardiff shale

The darker beds which chiefly comprise this mass bear but few traces of organic remains. Conditions here as in the Marcellus shale were not favorable to life. Its species are

<i>Orbiculoidea minuta</i> Hall	<i>Liorhynchus limitaris</i> Vanuxem
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The more calcareous and upper beds, which form blue black harder layers, show an addition of representatives from the constantly nearer zone of prolific life in the overlying shales. These have been taken from the beds at Chapinville and along Mud creek and are:

<i>Rhinocaris veneris</i> Hall & Clarke. r	<i>Styliolina fissurella</i> Hall..... c
<i>Phacops rana</i> Green..... r	<i>Pleurotomaria rugulata</i> Hall..... c
<i>Orthoceras nuntioides</i> Clarke..... r	<i>Nuculites oblongatus</i> Conrad..... c
<i>Gomphoceras mitriforme</i> Clarke.. r	<i>Luchiola stuprosa</i> Clarke..... r
<i>Bactrites clavus</i> Hall..... c	<i>Pterochaenia fragilis</i> Hall..... r
<i>Tornoceras discoldeum</i> Conrad.... c	<i>Strophalosia truncata</i> Hall..... c

Skaneateles shale

The fauna of these beds is very sparse, a few species characteristic of the black beds intermingled with some from the more calcareous beds above. As the mass represents essentially a

phase of transition from the condition of the black sediments to those of shallower and clearer water deposit, the fauna is also mixed and transitional. It contains:

<i>Phacops rana</i> Green.....	rr	<i>Chonetes setiger</i> Hall.....	c
<i>Styliolina fissurella</i> Hall.....	c	<i>Spirifer mucronatus</i> Conrad.....	r
<i>Pleurotomaria rugulata</i> Hall....	c	<i>Ambocoella umbonata</i> Conrad....	c
<i>Lunulicardium curtum</i> Hall.....	r	<i>Llorhynchus limitaris</i> Vanuxem.	c
<i>Nuculites oblongatus</i> Conrad....	c	<i>L. multicosta</i> Hall.....	c

Canandaigua shale and limestone

With these beds begins the profuse development of the calcareous Hamilton shales. Though the rocks of this stage are treated as a unit on the map their faunas may be here considered in two divisions, that of (1) the Centerfield limestones or the calcareous beds at the base, (2) the upper division or the Canandaigua shales.

1 In the Centerfield limestones, best developed on Shaffer creek and underlying all the northern part of the village of Canandaigua, the following species have been noted:

Worms

<i>Arabellites</i>	r
<i>Oenonites</i>	r
<i>Eunicites</i>	r
<i>Spirorbis angulatus</i> Hall.....	c
<i>Cornulites tribulis</i> Hall.....	r

Crustaceans

<i>Phacops rana</i> Green.....	cc
<i>Dalmanites boothi</i> Green.....	cc
<i>D. boothi</i> var. <i>calliteles</i> Green....	cc
<i>Proetus rowi</i> Green.....	cc
<i>P. macrocephalus</i> Hall	
<i>Cyphaspis ornata</i> Hall	
<i>C. ornata</i> var. <i>baccata</i> Hall & Clarke	
<i>C. craspedota</i> Hall & Clarke	
<i>Turrilepas devonica</i> Clarke	
<i>T. squama</i> Hall & Clarke	
<i>T. nitidula</i> Hall & Clarke	
<i>T. foliata</i> Hall & Clarke	
<i>T. tenera</i> Hall & Clarke	
<i>Schizodiscus capsula</i> Clarke	

Gastropods

<i>Bellerophon pelops</i> Hall	
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Cyrtolites mitella Hall

<i>Platyceras auriculatum</i> Hall....	c
<i>P. symmetricum</i> Hall.....	c
<i>P. thetis</i> Hall.....	c
<i>F. subspinosum</i> Hall	
<i>Pleurotomaria itys</i> Hall	
<i>P. lucina</i> Hall	
<i>P. disjuncta</i> Hall.....	r
<i>Loxonema delphicola</i> Hall	
<i>L. hamiltoniae</i> Hall	

Lamellibranchs

<i>Mytilarca oviformis</i> Conrad.....	c
<i>Microdon bellistriatus</i> Conrad	
<i>Conocardium crassifrons</i> Conrad	
<i>Cypricardinia indenta</i> Conrad...	c
<i>Actinopteria decussata</i> Conrad..	c
<i>Aviculopecten princeps</i> Conrad..	c
<i>Lingula leana</i> Hall.....	r
<i>L. densa</i> Hall	
<i>Crania crenistria</i> Hall	
<i>Craniella hamiltoniae</i> Hall.....	c
<i>Rhipidomella penelope</i> Hall.....	c

Brachiopods

<i>R. vanuxemi</i> Hall.....	c
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Orthothetes arctostriatus <i>Hall</i> .. c	<i>Crinoids</i>
Stropheodonta concava <i>Hall</i>	Platycrinus eboraceus <i>Hall</i> r
S. demissa <i>Conrad</i> c	Megistocrinus ontario <i>Hall</i> r
S. inequistriata <i>Conrad</i> c	<i>Corals</i>
Pholidostrophia nacreata <i>Hall</i> c	Zaphrentis halli <i>Edwards &</i>
Leptostrophia perplana <i>Conrad</i>	<i>Haime</i> c
Chonetes coronatus <i>Conrad</i> c	Z. simplex <i>Hall</i>
C. deflectus <i>Hall</i>	Cystiphyllum varians <i>Hall</i>
Productella navicella <i>Hall</i>	C. confollis <i>Hall</i>
P. spinulicosta <i>Hall</i>	C. americanum <i>Edwards &</i>
Spirifer angustus <i>Hall</i> r	<i>Haime</i> cc
S. divaricatus <i>Hall</i>	Cyathophyllum robustum <i>Hall</i> ... c
S. fimbriatus <i>Conrad</i> c	C. nanum <i>Hall</i>
S. audaculus <i>Conrad</i> c	C. conatum <i>Hall</i> c
S. mucronatus <i>Conrad</i>	Amplexus hamiltoniae <i>Hall</i>
S. consobrinus <i>d'Orbigny</i>	Heliophyllum halli <i>Edwards &</i>
Ambocoelia umbonata <i>Conrad</i> ... c	<i>Haime</i> cc
Nucleospira concinna <i>Hall</i> cc	H. halli <i>var. irregulare</i> <i>Hall</i> c
Trematospira hirsuta <i>Hall</i>	H. halli <i>var. reflexum</i> <i>Hall</i>
Meristella haskinsi <i>Hall</i> cc	H. obconicum <i>Hall</i>
Atrypa reticularis <i>Linné</i>	H. confluent <i>Hall</i> r
Camarotoechia dotis <i>Hall</i>	Favosites placenta <i>Rominger</i> ... cc
C. horsfordi <i>Hall</i> c	F. arbusculus <i>Hall</i>
C. prolifica <i>Hall</i>	F. argus <i>Hall</i> c
C. sappho <i>Hall</i>	Alveolites goldfussi <i>Billings</i> c
Pentamerella pavilionensis <i>Hall</i>	Pleurodictyum stylopora <i>Eaton</i>
Cryptonella planirostris <i>Hall</i>	Striatopora limbata <i>Eaton</i> c
C. rectirostris <i>Hall</i> c	

Canandaigua shales proper

The beds above the "basal limestones" as they were originally termed by the writer, carry a less profuse fauna. The species assembled in the following list are from more numerous outcrops than the foregoing but, save at the very top of the formation just beneath the Tichenor limestone, they are seldom if ever as abundant in any single locality. There are some noteworthy differences in the composition of the faunas of these two parts of the Canandaigua beds, which are below singled out in special lists. The fossils herein are:

<i>Crustaceans</i>	<i>Worms</i>
Phacops rana <i>Green</i>	Spirorbis angulatus <i>Hall</i>
Dalmanites boothi <i>Green</i>	<i>Cephalopods</i>
Proetus macrocephalus <i>Hall</i>	Orthoceras exile <i>Hall</i>
Ostracodes of the genera	O. nuntium <i>Hall</i> c
Beyrichia, Entomis, Primitia	O. crotalus <i>Hall</i> r
and Bollia in the lower shales. cc	Gyroceras liratum <i>Hall</i>
<i>Estheria pulex</i> <i>Clarke</i> r	Tornoceras uniangularare <i>Conrad</i> .. r
	Bactrites tenuicinctus <i>Hall</i>

Pteropods

<i>Styliolina fissurella</i> Hall.....	c
<i>Hyolithus acilis</i> Hall.....	r

Gastropods

<i>Bellerophon leda</i> Hall.....	c
<i>B. lyra</i> Hall.....	r
<i>B. acutilira</i> Hall.....	r
<i>Cyrtolites mitella</i> Hall.....	r
<i>Platyceras symmetricum</i> Hall...	c
<i>P. erectum</i> Hall	
<i>P. conicum</i> Hall	
<i>P. attenuatum</i> Hall	
<i>P. thetis</i> Hall	
<i>P. bucculentum</i> Hall.....	c
<i>P. carinatum</i> Hall.....	c
<i>P. echinatum</i> Hall	
<i>Pleurotomaria capillaria</i> Conrad.	c
<i>P. itys</i> Hall.....	c
<i>P. trilix</i> Hall	
<i>Loxonema delphicola</i> Hall	
<i>Diaphorostoma lineatum</i> Conrad.	cc
<i>Cyclonema hamiltoniae</i> Hall	
<i>C. multilira</i> Hall	
<i>Euomphalus rudis</i> Hall	
<i>Murchisonia turricula</i> Hall.....	r
<i>Macrochellus hebe</i> Hall	

Lamellibranchs

<i>Mytilarca oviformis</i> Conrad	
<i>Macrodon hamiltoniae</i> Hall	
<i>Microdon bellistriatus</i> Conrad	
<i>Buchiola halli</i> Clarke	
<i>Cypricardinia indenta</i> Conrad	
<i>C. pygmaea</i> Hall	
<i>Grammysia arcuata</i> Hall	
<i>Goniophora acuta</i> Hall	
<i>Modiomorpha complanata</i> Hall	
<i>M. concentrica</i> Conrad	
<i>M. macilentia</i> Hall	
<i>Nuculites oblongatus</i> Conrad	
<i>Aviculopecten princeps</i> Conrad	
<i>Palaeoneilo constricta</i> Conrad	
<i>P. emarginata</i> Conrad	
<i>P. fecunda</i> Hall	
<i>P. plana</i> Hall	
<i>P. tenuistriata</i> Hall	

Brachiopods

<i>Cranella hamiltoniae</i> Hall	
<i>Rhipidomella penelope</i> Hall.....	c
<i>R. vanuxemi</i> Hall.....	cc
<i>Orthothetes pandora</i> Billings	
<i>Stropheodonta concava</i> Hall	
<i>S. inequistriata</i> Conrad.....	cc
<i>S. junia</i> Hall.....	c
<i>Pholidostrophia naerea</i> Hall	
<i>Leptostrophia perplana</i> Conrad..	cc
<i>Chonetes coronatus</i> Conrad.....	c
<i>C. lepidus</i> Hall	
<i>C. deflectus</i> Hall	
<i>C. scitulus</i> Hall	
<i>Productella navicella</i> Hall	
<i>P. tullia</i> Hall	
<i>Spirifer angustus</i> Hall	
<i>S. fimbriatus</i> Conrad.....	c
<i>S. granulosus</i> Conrad.....	c
<i>S. audaculus</i> Conrad	
<i>S. marcyi</i> Hall	
<i>S. mucronatus</i> Conrad.....	c
<i>S. consobrinus d'Orbigny</i>	
<i>Ambocoelia umbonata</i> Conrad...	cc
<i>A. praeumbona</i> Hall	
<i>Cyrtina hamiltonensis</i> Hall	
<i>Nucleospira concinna</i> Hall.....	cc
<i>Trematospira hirsuta</i> Hall.....	c
<i>T. nobilis</i> Hall	
<i>Trigleria lepida</i> Hall	
<i>Meristella haskinsi</i> Hall	
<i>Athyris spiriferoides</i> Eaton.....	c
<i>Camarotoechia congregata</i> Conrad	
<i>C. sappho</i> Hall	
<i>Liorhynchus multicosta</i> Hall....	r
<i>L. quadricostatus</i> Vanuxem.....	r
<i>Pentamerella pavilionensis</i> Hall..	c
<i>Cryptonella rectirostris</i> Hall	
<i>Terebratulina lincklaeni</i> Hall	
<i>Tropidoleptus carinatus</i> Conrad..	cc

Crinoids

<i>Nucleocrinus lucina</i> Hall	
<i>Dolatocrinus glyptus</i> Hall	
<i>D. liratus</i> Hall	

On comparing these lists of species we find that while they are essentially homogeneous there are certain characteristic differences.

Centerfield limestone

Profusion of Trilobites representing all species of the Hamilton fauna except *Homalonotus dekayi*. Cirripedes and Schizodiscus

Cephalopods rare or absent

Bellerophon pelops

Platycerasc

Pleurotomaria lucina

P. disjuncta

Actinopteria decussata

Lingulasc

Pholidostrophia nacreatacc

Leptostrophia perplanar

Spirifer divaricatus

Corals very abundant forming a well marked plantation

Canandaigua shale

Trilobites relatively rare, the only common species *Phacops rana*, *Dalmanites boothi*, *Proetus macrocephalus*, *H. dekayi*. Other crustacea, except ostracodes rare or absent

Orthoceras, Gyroceras, Bactrites, Tornoceras

B. leda

B. lyra

B. acutillira

Platycerascc

Diaphorostoma lineatumc

Murchisonia

Macrochilus

Cyclonema

Modiomorpha complanata

M. concentrica

M. macilenta

Gonlophora acuta

Grammysia arcuata

Palaeoneilo constricta, *emarginata*, *fecunda*, *plana*, *tenuistriata*

P. nacreatar

L. perplanacc

Trematospira nobilis

Athyris spiriferoides

Trigleria lepida

Tropidoleptus carinatus

Corals quite rare

Future investigations may obliterate some of these differences yet there will doubtless remain a distinction in the upper and lower elements of this fauna though these are bound together by a multitude of identities.

Tichenor limestone

Fossils are extremely few in this layer of semicrystalline gray limestone. They are frequently replaced wholly or in part by

celestite and hence at times make very striking specimens. They are:

Phacops rana Green
Orthoceras caelamen Hall
O. exile Hall

Lyriopecten orbiculatus Hall
Spirifer mucronatus Conrad
Spirophyton typus Hall

The last named object covers surfaces of the rock when inclined to be shaly.

Moscow shales

Lower division

The Moscow shales are well divided into subequal parts by the Menteth limestone and as there is a lithologic difference in the two on account of the gradual loss of calcareous content, we may contrast the faunas of these divisions. Lower beds:

Crustaceans

Phacops rana Green.....ccc
Dalmanites boothi Green.....c
Proetus macrocephalus Hall
Homalonotus dekayi Hall

Worms

Spirorbis angulatus Hall

Cephalopods

Orthoceras nuntium Hall
Gyroceras liratum Hall
Tornoceras uniangulare Conrad
Bactrites tenuicinctus Hall

Pteropods

Tentaculites bellulus Hall
Hyolithus acilis Hall

Gastropods

Bellerophon leda Hall
B. patulus Conrad
B. thalia Hall
Platyceras carinatum Hall
P. conicum Hall
P. thetis Hall
Pleurotomaria itys Hall
Loxonema delphicola Hall
Diaphorostoma lineatum Conrad.ccc
Cyclonema trillix Hall

Lamellibranchs

Mytilarca oviformis Conrad
Macrodon hamiltoniae Hall
Microdon bellistriatus Conrad
Cypricardina indenta Conrad

C. pygmaea Hall
Grammysia arcuata Conrad
G. bisulcata Conrad
Gonlophora acuta Hall
Modiomorpha concentrica Conrad
Aviculopecten parilis Conrad
Palaeonello fecunda Hall
P. muta Hall
P. plana Hall
P. tenuistriata Hall
Actinopteria decussata Hall.....c

Brachiopods

Cranella hamiltoniae Hall
Crania crenistria Hall
Pholidops hamiltoniae Hall
Rhipidomella penelope Hall
R. vanuxemi Hall.....c
Stropheodonta concava Hall.....c
S. inequistriata Hall.....c
S. junia Hall.....c
Leptostrophia perplana Conrad....cc
Chonetes coronatus Conrad
C. deflectus Hall
Productella papulata Hall
P. spinulicosta Hall
Spirifer marcyi Hall
S. mucronatus Conrad.....c
S. consobrinus, d'Orbigny
Ambocoella umbonata Conrad
Nucleospira concinna Hall
Trematospira gibbosa Hall
Meristella haskinsi Hall
Athyris spiriferoides Eaton.....c

<i>Atrypa reticularis</i> Linné.....c	<i>Aorocrinus cauliculus</i> Hall
<i>Camarotoechia congregata</i> Conrad	<i>A. pocillum</i> Hall
<i>C. prolifica</i> Hall	<i>A. praecursor</i> Hall
<i>Pentamerella pavilionensis</i> Hall...cc	<i>Eleutheroocrinus whitfieldi</i> Hall
<i>Cryptonella planirostris</i> Hall	<i>Gennaeocrinus eucharis</i> Hall
<i>C. rectirostris</i> Hall	<i>G. nyssa</i> Hall
<i>Tropidoleptus carinatus</i> Conrad...cc	<i>Gilbertsocrinus spinigerus</i> Hall
<i>Crinoids</i>	<i>Melocrinus gracilis</i> W. & S.
<i>Platycrinus</i> sp.	<i>Poteriocrinus diffusus</i> Hall
<i>Meglistocrinus depressus</i> Hall	<i>P. nereus</i> Hall
<i>M. ontario</i> Hall	<i>P. nycteus</i> Hall
<i>Thylacocrinus clarkel</i> W. & S.	<i>Poteriocrinus</i> sp.
<i>Ancyrocrinus bulbosus</i> Hall	<i>Rhodocrinus gracilis</i> Hall
<i>Dolatocrinus liratus</i> Hall	<i>R. spinosus</i> Hall
<i>D. intermedius</i> Hall	<i>R. nodulosus</i> Hall
<i>D. glyptus</i> Hall	<i>Nucleocrinus lucina</i> Hall
<i>D. troostii</i> Hall	<i>Pentremites leda</i> Hall

Menteth limestone

In this thin layer the species of the fauna are crowded together in great numbers. Several years ago the late Prof. Charles E. Beecher of Yale University collected at the localities of this interesting formation, and the etchings from the material thus gathered have been studied and identified by Percy E. Raymond of the Carnegie Museum, Pittsburg. Mr Raymond is about to publish some account of the fauna and he has permitted me to give here his list of species determined to which I have added a few not recognized by him.

Worms

Spirorbis angulatus Hall
S. spinuliferus Nich.
Cornulites tribulis Hall
Cornulites sp. nov.
Autodetus lindstroemi Clarke
Autodetus sp. nov.
Proetus rowi Green
P. macrocephalus Hall
Cyphasplis ornata Hall
Homalonotus deKayi Green
Phacops rana Green
Cryphaeus boothi Green

Crustaceans

Primitiopsis punctilifera Hall
Kirkbya parallela Ulrich
Strepula sigmoidalis Jones

Isocillina lineata Jones

I. (?) fabacea Jones
Primitia seminulus Jones
Octonaria stigmata Ulrich
Ctenobolina papillosa Ulrich
Beyrichia kolmodini Jones
Halliella retifera Ulrich
Moorea bicornuta Ulrich
Ostracoda—several unidentified species

Cephalopods

Orthoceras sp. ind.

Pteropods

Styliola sp. und.
Tentaculites bellulus Hall
Hyolithes acilis Hall

Gastropods

Loxonema hamiltoniae Hall
Pleurotomaria capillaria Conrad
Cyclonema hamiltoniae (?) Hall
Bellerophon leda Hall
Platyceras bucculentum Hall
P. carinatum Hall
P. symmetricum Hall
P. thetis Hall
Diaphorostoma lineatum Conrad

Lamellibranchs

Nuculites oblongatus Conrad
N. triqueter Conrad
Nucula corbuliformis Hall
Palaeonello constricta Conrad
Conocardium eboraceum Hall
Actinopteria decussata Hall
Aviculopecten excavatus Hall
A. princeps Conrad
A. scabridus Hall
Pterinopecten intermedius Hall
P. hermes Hall
P. regularis Hall
P. conspectus Hall
Lyriopecten orbiculatus Hall
Modiomorpha alata Conrad
Cypricardella bellistriata Conrad
Cypricardinia indenta Conrad
Nyassa arguta Hall

Brachiopods

Lingula punctata Hall
Lingula sp. ind.
Pholidops oblata Hall
P. hamiltoniae Hall
Crania crenistriata Hall
Craniella hamiltoniae Hall
Camarotoecchia congregata Conrad
C. horsfordi Hall
C. sappho Hall
Trigleria lepida Hall
Eunella lincklaeni Hall
Tropidoleptus carinatus Conrad
Atrypa reticularis Linn.
Cyrtina hamiltonensis Hall
Spirifer mucronatus Conrad
S. audaculus Conrad
S. granulatus Conrad
S. consobrinus d'Orb.

S. sculptis Hall
S. limbriatus Conrad
Ambocoelia umbonata Conrad
Nucleospira concinna Hall
Athyris spiriferoides Eaton
Stropheodonta concava Hall
S. demissa Conrad
S. inequistriata Conrad
S. junia Hall
Leptostrophia perplana Conrad
Pholidostrophia lowensis Owen.
Orthothetes chemungensis pectina-
ceus Hall
O. chemungensis arctistriatus Hall
O. bellulus Clarke
Chonetes coronatus Conrad
C. mucronatus Hall
C. scitulus Hall
C. deflectus Hall
C. robustus Raymond
Strophalosia truncata Hall
Productella spinulicosta Hall
Rhipidomella penelope Hall
R. vanuxemi Hall

Bryozoans

Ascodictyum stellatum N. & E.
Pinacotrypa plana Hall
Monotrypa fruticosa Hall
Monotrypa sp. und.
Fenestella emaciata Hall
Reteporina striata Hall
Isotrypa sp. und.
Hemitrypa cribosa Hall
Polypora fistulata Hall
P. multiplex Hall
Rhombopora tortalineae Hall
Streblotrypa hamiltonensis Nich.
Ptilodictya plumea Hall
Cystodicta incisurata Hall
Taenelopora exigua Nich.
Acrogenia prolifera Hall
Lichenalia stellata Hall
Paleschara reticulata Hall

Corals

Heliophyllum halli E. & H.
Michelinia stylopore Eaton
Aulopora serpens Goldf.
Ceratopora dichotoma Grabau
C. jacksoni Grabau

Moscow shales*Upper division*

Fossils in these beds are less profuse though more numerous in species. They are quite uniformly distributed through the lower portion but farther up become arranged in thin beds separated by more or less wide intervals of barren shales.

Thin layers of limestone in these upper shales carry agglomerated masses of fossils.

Crustaceans

Phacops rana Green.....c

Cryphaeus boothi Green

Proetus macrocephalus Hall

Homalonotus dekayi Green

Worms

Spirorbis angulatus Hall

Cephalopods

Orthoceras exile Hall

O. emaceratum Hall

O. nuntium Hall

O. crotalus Hall

Gyroceras liratum Hall

Bactrites tenuicinctus Hall

Pteropods

Styllolina fissurella Hall

Hyolithus acilis Hall

Gastropods

Bellerophon leda Hall

Platyceras carinatum Hall

P. echinatum Hall

P. erectum Hall

P. rectum Hall

P. symmetricum Hall

Pleurotomaria capillaria Conrad

P. itys Hall

P. lucina Hall

P. rotalia Hall

Loxonema delphicola Hall

Diaphorostoma lineatum Conrad

Lamellibranchs

Macrodon hamiltoniae Hall

Microdon bellistriatus Conrad

Cypricardinia indenta Conrad

Grammysia arcuata Hall

G. bisulcata Conrad

Gonlophora hamiltonensis Hall

Modiomorpha macilenta Hall

Nucula corbuliformis Hall

N. lirata Conrad

Nuculites oblongatus Conrad

Orthonota carinata Conrad

O. parvula Hall

O. undulata Conrad.....cc

Palaeonello constricta Conrad

P. tenuistriata Hall

Pholadella radiata Hall

Phthonia nodocostata Hall

Sanguinolites solenoides Hall

Tellinopsis subemarginata Conrad

Brachiopods

Lingula punctata Hall.....cc

Dignomia alveata Hall

Cranella hamiltoniae Hall

Crania crenistriata Hall

Pholidops hamiltoniae Hall.....c

P. oblata Hall

Rhipidomella penelope Hall

R. vanuxemi Hall.....c

Orthothetes pandora Billings

O. arctostriatus Hall

Stropheodonta concava Hall

S. demissa Conrad.....rr

S. inequistriata Conrad

S. junia Hall

Pholidostrophia nacreia Hall

Chonetes aurora Hall

C. coronatus Conrad.....c

C. deflectus Hall.....c

C. lepidus Hall.....c

C. scitulus Hall.....c

Spirifer granulosus Conrad

S. marcyi Hall

S. audaculus Conrad

<i>S. tullius</i> Hall.....c	<i>C. dotis</i> Hall
<i>S. eatoni</i> Hall	<i>C. sappho</i> Hall
<i>Cyrtina hamiltonensis</i> Hall	<i>Cryptonella rectirostris</i> Hall
<i>Ambocoelia umbonata</i> Conrad....cc	<i>Eunella lincklaeni</i> Hall
<i>Nucleospira concinna</i> Hall.....c	<i>Tropidoleptus carinatus</i> Conrad
<i>Trematospira hirsuta</i> Hall	
<i>Meristella haskinsi</i> Hall	<i>Crinoids</i>
<i>Athyris spiriferoides</i> Eaton.....cc	<i>Nucleocrinus lucina</i> Hall
<i>Atrypa reticularis</i> Linné.....cc	<i>Forbesiocrinus lobatus</i> Hall
<i>A. spinosa</i> Hall.....c	<i>Calceocrinus clarus</i> Hall
<i>Camarotoechia congregata</i> Conrad	<i>Platycrinus eboraceus</i> Hall

The contrasts in the faunas of these upper and lower beds are not deep seated. There is in the former as a most striking feature the profuse development of the crinoids associated with an almost equal profusion of *Phacops rana*, *Diaphorostoma lineatum* and *Pentamerella pavilionensis* with *Productella papulata*; in the upper beds lamellibranch species such as *Orthonota undulata*, *parvula*, *carinata*, *Phthonia nodocostata*, *Pholadella radiata* and specially *Tellinopsis submarginata* which are rare or absent below. There are also here thin beds wholly composed of *Ambocoelia umbonata* but on the whole the distribution of the fauna throughout the Moscow shales is quite uniform.

The Moscow shales are exposed in detail in the ravine at Tichenor point where the succession from the bottom up is essentially as follows:

At the base the uppermost beds of the Canandaigua shales with *Eridophyllum archiaci*, *Heliophyllum* and other cyathophylloids in abundance.

Tichenor limestone

1 Blue calcareous shale with crinoids, *Pentamerella pavilionensis*, *Diaphorostoma lineatum*, *Phacops rana*, 2 feet, passing into a thin limestone 8 inches

2 Bluish shale with *Tropidoleptus carinatus*, 30 feet

3 Menteth limestone, 1 to 1½ feet

4 Bluish shale with *Tropidoleptus carinatus*

5 Olive shales with *Cryphaeus boothi*

6 Arenaceous shale with *Homalonotus dekayi*, *Orthonota*, abounding in grotesque calcareous concretions and passing into a thin limestone above, 12 feet

7 Olive shale

8 Very soft light gray shales with *Ambocoelia*, *Chonetes*, *Athyris* and *Phacops* in distant thin layers

9 Olive shale

Tully pyrite

Genesee shale

Tully limestone and pyrite

What little Tully limestone is here represented carries the indicial species *Hypothyris cuboides* Sowerby (sp.) identified originally by Conrad with Sowerby's *Rhynchonella cuboides* and subsequently described by Hall as *R. venustula*.

The species *R. cuboides* was long ago referred by King to the genus *Hypothyris*. This world-wide species is here a newcomer into the Devonian faunas and is associated throughout the exposures of the Tully with an assemblage essentially consisting of Hamilton species, though slight variations from Hamilton types are indicated and there are a few additional species present like the very characteristic trilobite *Bronteus tullius* Hall & Clarke. For at least a half century *Hypothyris cuboides* has been recognized as indicative of lowest upper Devonian age and the *Bronteus* associated with it is likewise of early Devonian type (*Thysanopeltis*). The fact that these species accompany an essentially unmodified fauna of earlier age does not argue that age for the limestone but serves to emphasize if anything the introduction of new types indicative of fundamental change.

The fauna of the pyrite layer is a parvifauna with affinities wholly or essentially with that of the Hamilton shales. It is in fact a series of forms which have as a whole suffered an arrest of development, and its species are immature stages of those preceding though they are actually in adult condition. The conditions of growth while this pyrite was being precipi-

tated, were so unfavorable that the organisms were able to advance but a little in the line of species development and yet they apparently acquired the power of reproduction and manifested themselves in these arrested conditions probably for several generations. These fossils were studied by the writer some years ago, and have been more exhaustively examined of late by Dr F. B. Loomis from material collected all along the line of outcrop of the layer.

The specimens are to be extracted from the rock only with great labor but it is to be expected that forms present at one place will appear at others and hence the entire list of the known species is here appended. It will be observed that the designations used in Dr Loomis's list here given indicate *mutations* only from the types of Hamilton species and not deep seated specific differences.

Crustaceans

Beyrichia dagon Clarke
Entomis prosephina Loomis
Cryphaeus boothi var. *calliteles* Green

Cephalopods

Bactrites (sp.)? *mut. parvus* Loomis
B. (sp.) *mut. pygmaeus* Loomis
Orthoceras nuntium Hall
O. scintilla (?) *mut. mephisto* Clarke
O. subulatum *mut. pygmaeus* Loomis
Tornoceras uniangulare *mut. astarte* Clarke
T. uniangulare Conrad

Pteropods

Tentaculites bellulus? *mut. stebos* Clarke
T. gracilistriatus *mut. asmodeus* Clarke

Gastropods

Loxonema delphicola *mut. moloch* Clarke
Pleurotomaria
P. itys *mut. pygmaea* Loomis
P. capillaria *mut. pygmaea* Loomis

Macrochillina hamiltoniae *mut. pygmaea* Loomis

M. hebe *mut. pygmaea* Loomis
Diaphorostoma lineatum *mut. bellal* Clarke

Lumellibranchs

Conocardium eboraceum *mut. pygmaeus* Loomis
Buchiola retrostriata *mut. pygmaea* Loomis
Grammysia constricta *mut. pygmaea* Loomis
Paracyclas lirata *mut. pygmaea* Loomis
Palaeoneilo constricta *mut. pygmaea* Loomis
P. plana *mut. pygmaea* Loomis
Leda rostellata *mut. pygmaea* Loomis
Nuculites oblongatus *mut. pygmaeus* Loomis
N. triqueter *mut. pygmaeus* Loomis
Nucula varicosa *mut. pygmaea* Loomis
N. corbulliformis *mut. pygmaea* Loomis
N. lirata *mut. pygmaea* Loomis

Brachiopods

Trigleria lepida *mut. pygmaea* Loomis
Productella spinulicosta *mut. pygmaea* Loomis
Strophalosia truncata *mut. pygmaea* Loomis
Tropidoleptus carinatus *mut. pygmaeus* Loomis
Ambocoella umbonata *mut. pluto* Loomis
A. umbonata *mut. pygmaea* Loomis
Nucleospira concinna *mut. pygmaea* Loomis

Cyrtina hamiltonensis *mut. pygmaea* Loomis
Spirifer marcyi *mut. pygmaeus* Loomis
S. granulosus *mut. pluto* Clarke
S. tullius *mut. belphegor* Clarke
S. medialis *mut. pygmaeus* Loomis
S. mucronatus *mut. hecate* Clarke
S. fimbriatus *mut. pygmaeus* Loomis
S. fimbriatus *mut. simplicissimus* Loomis
Crinoid stems
Pentremites leda Hall

Genesee shale

This shale carries only a sparse fauna and its fossils are not well preserved. In the densely black layers there is rarely anything to be obtained, but lignites sometimes of considerable length, occasionally *Lepidodendron* and conodont teeth have also been found herein.

The less bituminous shales contain:

Pleurotomaria rugulata Hall
Styliolina fissurella Hall
Pterochaenia fragilis Hall
Lingula spatulata Hall
Orbiculoidea lodensis Hall

Liorhynchus quadricostatus Hall
Probeloceras lutheri Clarke (occasionally)
Bactrites aciculum Hall

Genundewa limestone

The fauna here appearing is, as we have explained on previous occasions, the first appearance in this district of the Portage or Naples fauna of the beds overlying. It is thus a prenuncial fauna announcing the invasion and occupancy of the field by a congeries of species not before known in New York. It is evident that this fauna came in from the west and covered for a short time only, the whole area from here westward to Lake Erie. We have shown elsewhere the probability that the rock itself, which is largely composed of the pteropod *Styliolina*, represents a deep water deposit of pteropod ooze and its associated organisms are also those of deep water habit. The fauna and flora of this limestone are as follows and in this list the

names in roman are of species reappearing in the higher faunas (Cashaqua); those in antique not occurring elsewhere.

Diniethys newberryi Clarke
Echinocaris? longicauda Hall
Spathiocaris emersoni Clarke
Cardiocaris
Manticoceras pattersoni Hall var.
styliophilum Clarke
M. contractum Clarke
M. fasciculatum Clarke
M. nodifer Clarke
Gephyroceras genundewa Clarke
Tornoceras uniangulare Conrad var.
compressum Clarke
Orthoceras atreus Hall
Styliolina fissurella Hall
Tentaculites gracilistriatus Hall
Pleurotomaria genundewa Clarke
Bellerophon koeneni Clarke
B. denckmanni Clarke
Phragmostoma natator Hall
P. incisum Clarke
Loxonema noe Clarke
Macrochilina pygmaea Clarke
M. seneca Clarke

Diaphorostoma pugnus Clarke
Protocalyptraea styliophila Clarke
Lunulicardium hemicardioides Clarke
L. encrinurum Clarke
Pterochaenia fragilis Hall
P. sinuosa Clarke
Honeoyea styliophila Clarke
H. simplex Clarke
Ontaria suborbicularis Hall
Buchiola retrostriata v. Buch
B. livoniae Clarke
B. scabrosa Clarke
Paracardium doris Hall
P. delicatulum Clarke
Lingula spatulata Vanuxem
Lingulipora williamsana Girty
Aulopora annectens Clarke
Cordaeoxylon clarkei Dawson
Cladoxylon mirabile Unger
Cyclostigma affine Dawson
Lepidodendron gasplanum Dawson
L. primaevum Rogers

Taken as a whole the assemblage is rich and interesting and there are not more favorable opportunities for its examination than are afforded on Canandaigua lake. Specially noteworthy are the remains of plants of genera and species which have been found elsewhere only in corresponding horizons of Europe.

West River shale

In these beds we find a return of the shale fauna beneath (Genesee) with a few additional species. The distinctive characters of the division are essentially lithologic. Its fossils are:

Bactrites aciculum Hall (?)
Gephyroceras sp.?
Pleurotomaria rugulata Hall
Buchiola retrostriata v. Buch
Panenka sp.

Pterochaenia fragilis Hall.....c
Lunulicardium curtum Hall
Lingula spatulata Vanuxem
Oriculoidea lodensis Vanuxem

Embedded in these shales not far above the Genundewa limestone is a thin and, over the region of this map, continuous limestone which is a mass of the crinoid *Melocrinus*

clarkei Hall. Over this surface for a brief period flourished a plantation of these crinoids and their substance has largely contributed to the lime content of the rock containing them.

Standish shales and flags

Fauna very sparse and chiefly that of the beds below.

Bactrites aciculum Hall?

Gephyroceras sp.

Pleurotomaria cognata Clarke

Pterochaenia fragilis Hall

Ontaria suborbicularis Hall

Middlesex shale

These densely bituminous deposits, similar in all respects to the Genesee shale bear only the most meager evidences of organic life. Indeterminable plant remains occasionally appear and with them are:

Conodonts

Sandbergeroceras syngonium Clarke

Ontaria suborbicularis Hall

The affinity of the fauna with that of the Cashaqua shales is herein evident.

Cashaqua shale

In these soft shale beds, with their accompanying flags and sands, the peculiar western Portage fauna attains its culmination. This interesting congeries of fossils has been termed the *Naples fauna* for it is here that it attains its best development. The term has been employed because of the indefiniteness of the term Portage as applied to the fauna, for the faunas existing in Portage time are known to differ highly according to their geographic location; brackish in eastern New York (Oneonta), a profuse brachiopod fauna in central New York (Ithaca) and in western New York a fauna essentially devoid of brachiopods but characterized by its abundance of cephalopods and lamelli-branches. In our latest studies of this fauna in its extent throughout western New York it has become evident that, in this western Portage province covering the field occupied by the fauna from Cayuga lake west to Lake Erie, the Genesee province as it has been designated, there are actually two subprov-

inces, an eastern (Naples subprovince) into which only the advance guard penetrated on its invasion from the west, and a western or Chautauqua subprovince. These two subfaunas of the Genesee provinces are knit together by unity of generic and to some extent of specific characters, but differ more in respect to predominant species.

We have then in the rocks before us the typical development of the fauna of this Naples subprovince or the Naples fauna in its proper sense.

The species are:

Crustaceans

Eleutherocaris whitfieldi Clarke
Stylonurus? wrightianus Dawson
Spathiocaris emersoni Clarke
Dipterocaris

Cephalopods

Manticoceras pattersoni Hall
M. apprimatum Clarke
M. tardum Clarke
M. accelerans Clarke
M. vagans Clarke
Probeloceras lutheri Clarke
P.? naplesense Clarke
Beloceras lynx Clarke
Tornoceras unilangulare Conrad
T. unilangulare var. *obesum* Clarke
Cyrtoclymenia neapolitana Clarke
Bactrites gracilior Clarke
B. aciculum Hall
Orthoceras pacator Hall
O. ontario Clarke
O. filosum Clarke

Pteropods

Hyalithus neapolis Clarke
Tentaculites gracilistriatus Hall
T. tenuicinctus Roemer
Styliolina fissurella Hall
Protospiralis minutissima Clarke

Gastropods

Loxonema noe Clarke
Macrochilina pygmaea Clarke
Palaeotrochus praecursor Clarke
Diaphorostoma rotundatum Clarke

Pleurotomaria cognata Clarke
P. ciliata Clarke
Protocalyptraea marshalli Clarke
Phragmostoma natator Hall
P. incisum Clarke
P. cf. triliratum Hall
Tropidocyclus hyalinus Clarke
Bellerophon koeneni Clarke

Lamellibranchs

Lunulicardium acutirostrum Hall
L. ornatum Hall
L. clymeniae Clarke
L. hemicardioides Clarke
L. velatum Clarke
L. finitimum Clarke
L. sodale Clarke
L. pilosum Clarke
L. parunculus Clarke
Pterochaenia fragilis Hall
P. fragilis var. *orbicularis* Clarke
P. perissa Clarke
Honeoyea erinacea Clarke
H. majora Clarke
Parptyx ontario Clarke
Ontaria suborbicularis Hall
O. clarkel Beushausen
O. affiliata Clarke
O. halli Clarke
Buchiola retrostriata v. Buch
B. scabrosa Hall
B. conversa Hall
Paracardium doris Hall
Palaeoneilo petila Clarke
P. muricata Clarke

*Brachiopods**Productella speciosa Hall**Chonetes scitulus Hall**Lingula triquetra Clarke**L. ligea Hall**Corals**Aulopora annectens Clarke**Crinoids**Melocrinus clarkel Hall**Plants**Cordaeoxylon clarkel Dawson**Lepidodendron gaspianum Dawson**L. primaevum Rogers*

In the midst of these Cashagua beds is the

Parrish limestone

which has frequently been referred to in our publications because, first, of its singular composition of greenish and reddish calcareous nodules, which are usually fused into a continuous mass and resemble the kramenzel so characteristic of some of the European Devonian beds of equivalent age, and again because the abundance of *Goniatites* which it contains chiefly of the species *Manticoceras pattersoni*, *Tornoceras uniangulare* and *Probeloceras lutheri*, together with *Orthoceras pacator*, some singular and undetermined fish remains and myriads of the pteropods *Styliolina* and *Protospiralis*. The rock is continuous nearly across the map and beyond it to the east.

Rhinestreet shale

In these recurrent beds of black shale the fauna is again very much curtailed. Only the following have been obtained from it:

*Polygnathus dubius Hinde**Prioniodus spicatus Hinde**P. erraticus Hinde**Palaeoniscus devonicus Clarke**Acanthodes pristis Clarke**Spathiocaris emersoni Clarke**Lunulicardium velatum Clarke**Pterochaenia fragilis Hall**Leptodomus multiplex Clarke***Hatch flags and shales**

The fossils in these arenaceous beds are all representatives of the Cashagua shale fauna but in very much decreased quantity. *Goniatites*, specially *Manticoceras pattersoni* and *Probeloceras lutheri* occur in the flagstones, also occasional specimens of *Lunulicardium ornatum* and *L.*

acutirostrum, *Honeoyea desmata* and *Buchiola retrostriata*, *Palaeotrochus praecursor* and *Bactrites*. In certain layers fragments of plants abound, chiefly of *Lepidodendron*.

Grimes sandstone

The Portage or Naples fauna has now disappeared except for a few straggling and modified representatives in the higher rocks and with the Grimes sandstone appears a well defined though somewhat sparse brachiopod fauna. We originally regarded this small fauna of the Grimes sandstone as a representative of the Chemung fauna but have subsequently expressed the view that it is rather the invading Ithaca fauna from the east. The distinction is a refined one; it would be extremely difficult to indicate at what time or horizon in the succession the term Chemung is to be applied to the homogeneous fauna occupying the field of central New York during the upper Devonian.

The fauna of the Grimes sandstone is as follows:

Protonympha devonica Clarke
Palaeochaeta salicifolia Clarke
Conularia cf. continens Hall
Paracyclas sp.
Grammysia subarcuata Hall
Aviculopecten cf. cancellatus Hall
Sphenotus sp.
Orbiculoidea
Schizophoria impressa Hall

Leptostrophia mucronata Vanuxem
Chonetes lepidus Hall
Liorhynchus mesacostalis Hall
L. globuliformis Vanuxem
Productella lachrymosa Hall
Ambocoella umbonata Conrad
Atrypa spinosa Hall
Paropsonema cryptophyllum Clarke
Dictyospongia haplea Hall & Clarke

West Hill flags and sandstone

The fauna of these beds is a continuation of the brachiopod fauna of the Grimes sandstone with some interesting additions. Nowhere are the fossils abundant and none are specially distinctive of the Chemung fauna so that we may regard these beds also as a continuation of the Ithaca invasion from the east. The fossils recorded are as follows:

Manticoceras oxy Clarke
Palaeotrochus praecursor Clarke
Aviculopecten cancellatus Hall

Grammysia elliptica Hall
Pholadella cf. parallela Hall
Leptodesma robustum Hall

Stropheodonta cayuta Hall
Leptostrophia perplana Conrad var.
nervosa Hall
Orthothetes chemungensis Conrad
Productella lachrymosa Hall
Spirifer mucronatus Conrad mut.
S. mesacostalis Hall.
Atrypa hystrix Hall

Ambocoelia umbonata Conrad
Cyrtina hamiltonensis Hall
Liorhynchus mesacostalis Hall
Hydnoceras tuberosum Conrad
H. variable Hall & Clarke
H. legatum Hall & Clarke
Ceratodictya annulata Hall
Hydriodictya cylinx Hall & Clarke

High Point sandstone

The interesting fauna of the calcareous or firestone layer of this formation was studied some years ago by the writer and its species have not been increased by later observations. These occur in the beds on High point, Naples:

Rhynchodus sp.
Cladodus sp.
Pterinea sp.
Orthis infera Calvin
Schizophoria iowensis Hall
Stropheodonta cayuta Hall
S. arcuata Hall
S. canace Hall & Whitfield
S. variabilis Calvin
S. exilis Calvin
Strophonella reversa Whitfield(?)
Orthothetes chemungensis Hall
Chonetes setiger Hall
Productella speciosa Hall
P. dissimilis Hall
Spirifer disjunctus Sowerby

S. orestes Hall & Whitfield
S. subattenuatus Hall
S. mesacostalis Hall
S. bimesialis Hall
Ambocoelia umbonata Conrad
Atrypa aspera Hall
A. hystrix Hall
A. reticularis Linné
Camarotoechia contracta Hall
Hypothyris pugnus Martin
Fistulipora occidens Hall & Whitfield
Polypora sp.
Fenestella sp.
Zaphrentis sp.
Receptaculites sp.
Dadoxylon clarkel Dawson

In this unusual congeries we find the earliest appearance of *Spirifer disjunctus*, which may be taken as indicating the advent of the true Chemung fauna. It is also important to note the very marked representation of species which were originally described from the upper Devonian of Iowa and have been observed nowhere else in the Appalachian region except spasmodically.

Exact correlation of the stages of the Iowan Devonian with that of New York is not practicable as the Silurian continental barrier between was the cause of great differences in sedimentation and fauna on its east and west sides, but this invading western fauna intercalated in the normal Chemung fauna of

this district may be regarded as an indication of the fact that the continental barrier was temporarily down and the western fauna migrated to the east.

Prattsburg sandstone

In these beds the fauna, which is fairly profuse in certain layers, does not materially differ from that of the West Hill beds. The Iowan species occurring in the High Point fauna are not present or if so are of extremely rare occurrence and certain species are abundant such as

<i>Spirifer mesastrialis</i> Hall	<i>Atrypa hystrix</i> Hall
<i>S. mucronatus</i> Conrad var. <i>posterus</i>	<i>A. reticularis</i> Linné
Hall & Clarke	<i>Stropheodonta cayuta</i> Hall

In certain of the beds from the upper part of the division occurs the trilobite *Bronteus senescens* Clarke, which has also been found as far south as Avoca, Steuben co. in the continuation of the same formation. Associated with it is the spiny crinoid *Hystericrinus depressus* Wachsmuth & Springer which is known only from these beds.



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New York State Museum

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The figures in parenthesis indicate the bulletin's number as a New York State Museum bulletin.

Geology. G1 (14) Kemp, J. F. *Geology of Moriah and Westport Townships, Essex Co. N. Y., with notes on the iron mines.* 38p. 7pl. 2 maps. Sep. 1895. 10c.

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- G2 (19)** Merrill, F: J. H. Guide to the Study of the Geological Collections of the New York State Museum. 162p. 119pl. map. Nov. 1898. [50c] *New edition in preparation.*
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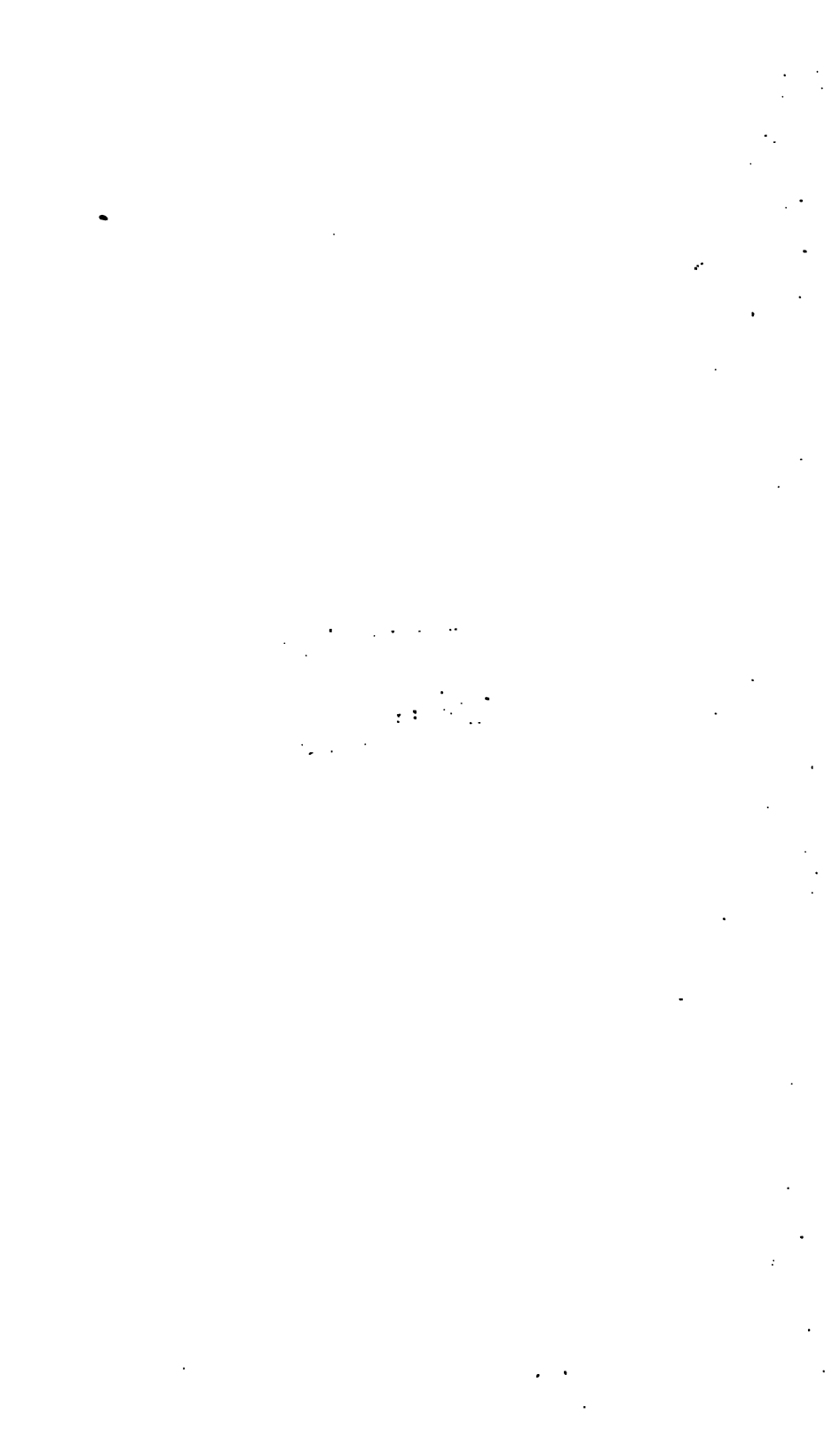
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The New York State Museum as at present organized is the outgrowth of the Natural History Survey of the State commenced in 1836. This was established at the expressed wish of the people to have some definite and positive knowledge of the mineral resources and of the vegetable and animal forms of the State. This wish was stated in memorials presented to the Legislature in 1834 by the Albany Institute and in 1835 by the American Institute of New York city and as a result of these and other influences the Legislature of 1835 passed a resolution requesting the secretary of state to report to that body a plan for "a complete geological survey of the State, which shall furnish a scientific and perfect account of its rocks, soils and materials and of their localities; a list of its mineralogical, botanical and zoological productions and provide for procuring and preserving specimens of the same; etc."

Pursuant to this request, Hon. John A. Dix, then secretary of state, presented to the Legislature of 1836 a report proposing a plan for a complete geologic, botanic and zoologic survey of the State. This report was adopted by the Legislature then in session and the governor was authorized to employ competent persons to carry out the plan which was at once put into effect.

The scientific staff of the Natural History Survey of 1836 consisted of John Torrey, botanist; James E. DeKay, zoologist; Lewis C. Beck, mineralogist; W. W. Mather, Ebenezer Emmons, Lardner Vanuxem and Timothy A. Conrad, geologists. In 1837 Mr Conrad was made paleontologist and James Hall, who had been an assistant to Professor Emmons, was appointed geologist to succeed Mr Vanuxem, who then took charge of Mr Conrad's geological district.

The heads of the several departments reported annually to the governor the results of their investigations, and these constituted the annual octavo reports which were published from 1837 to 1841. The final reports were published in quarto form, beginning at the close of the field work in 1841, and 3000 sets have been distributed, comprising four volumes of geology, one of mineralogy, two of botany, five of zoology, five of agriculture, and eight of paleontology.

Published monthly by the

University of the State of New York

ALBANY, N. Y.

State of N. Y. 610330
High School Department

INCLUDING ACADEMIES AND ALL INTERESTS OF SECONDARY EDUCATION

Bulletin 23

DIRECTOR'S REPORT 1903

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ALBANY

UNIVERSITY OF THE STATE OF NEW YORK

1904

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University of the State of New York

REGENTS 1908

With years of election

1892	WILLIAM CROSWELL DOANE D.D. LL.D.	<i>Chancellor</i> , Albany
1878	WHITELAW REID M.A. LL.D.	- <i>Vice Chancellor</i> , New York
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1901	ROBERT C. PRUYN M.A.	- - - Albany
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1903	JOHN F. O'BRIEN	Secretary of State, <i>ex officio</i>
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1903	CHARLES S. FRANCIS B.S.	- - - Troy

One vacancy

SECRETARY

Elected by Regents

1900 JAMES RUSSELL PARSONS JR M.A. LL.D.

DIRECTORS OF DEPARTMENTS

1888	MELVIL DEWEY M.A. LL.D.	<i>State Library and Home Education</i>
1890	JAMES RUSSELL PARSONS JR M.A. LL.D.	
		<i>Administrative, College and High School Depts</i>
1890	FREDERICK J. H. MERRILL Ph.D.	<i>State Museum</i>

High School Department

INCLUDING ACADEMIES AND ALL INTERESTS OF SECONDARY EDUCATION

Bulletin 23

DIRECTOR'S REPORT 1903

To the Regents of the University of the State of New York

The following report of the High School Department for the year ending June 30, 1903,¹ was prepared under my direction by Head Inspector Charles F. Wheelock and Inspector Charles N. Cobb.

Scope. This department includes academies, placed under the Regents in 1784, and academic departments of union schools under their supervision by the original union free school act of 1853, with other interests of secondary education.

ACTION BY THE REGENTS

Charter amended. On unanimous request of the trustees,

Voted, That the limited charter of the University Preparatory School, Ithaca, be amended by substituting \$100,000 for \$50,000 as the amount of capital stock. [Dec. 4, 1902]

Voted, That the academic department of Savannah Union School be continued on the list of University institutions, the defect in the organization of the union school having been corrected. [Dec. 4, 1902]

Names changed. On unanimous request of the trustees,

Voted, That under authority of §29 of the University law, the name of Champlain Institute, Port Henry, be changed to Champlain Academy. [Dec. 4, 1902]

¹All statistics in this report, unless otherwise specified, are for the year ending June 30, 1903.

Leases approved. *Voted*, That the lease of the Delaware Academy to the board of education of Union Free School District No. 16 of Delhi, and that of Delaware Literary Institute to the board of education of Union Free School District No. 10 of Franklin, and that of Munro Collegiate Institute to the board of education of Union Free School District No. 9 of Elbridge are hereby approved. [Dec. 4, 1902]

Contracts approved. *Voted*, That the contract between Union Free School District No. 10 of Cazenovia and Cazenovia Seminary under laws of 1902, ch. 325, be and is hereby approved. [Dec. 4, 1902]

Voted, That a certificate of approval of the contract between Union Free School District No. 1 of the town of Randolph and Chamberlain Institute of Randolph under laws of 1902, ch. 325, be issued on receiving satisfactory evidence that Chamberlain Institute has paid in full its teachers for services rendered in the academic year ending June 30, 1902. [Dec. 4, 1902]

Voted, That Scottsville Union School receive quota and attendance for 1903, since the application for its admission was filed and approved Sep. 1, 1902. [Dec. 4, 1902]

Voted, That North Bangor Union School receive the \$100 quota and \$37.86 for attendance for the year 1902, as its failure to report 175 days in session was due to the fact that the school was closed by order of the board of health; that West Eaton Union School receive the \$100 quota and \$9.80 for attendance for 1901, as it could not report 1000 days' attendance of academic students in 1901 for the same reason; that Dannemora Union School receive the \$100 quota for 1902 as owing to a misunderstanding they had been led to expect it as usual under the old rule; that Lyon Mountain Union School receive the \$100 quota and \$7.05 for attendance for 1902, as its failure to report 1000 days' attendance of academic students in 1901 was fully explained and was excused by the Regents July 2, 1902.¹ [Dec. 4, 1902]

¹Subsequent inspection having shown that this school was not maintaining satisfactory standards this apportionment was withheld.

Legislation. *Voted*, That the secretary be directed to apply to the Legislature for such amendment of the University law, and other needful legislation, if any, as will, in any case of contemplated or decreed dissolution of a corporation by the Regents, on their application or that of the trustees of the corporation, authorize the courts to appoint a receiver to liquidate its business under judicial direction and customary or prescribed procedure. [Dec. 4, 1902]

Voted, That the Legislature be requested to amend the code of civil procedure by enacting the following as part of title 10 of chapter 17 of the code of civil procedure:

§2418 This title does not apply to any corporation whose name the Regents of the University might change under the University law. [Dec. 4, 1902]

Voted, That the Legislature be requested to amend §2 of chapter 567 of the laws of 1890, so as to exclude from the operation of that section, corporations which might be incorporated by the Regents of the University. [Dec. 4, 1902]

Corporate and local names. On motion of the Superintendent of Public Instruction,

Voted, That the charter committee be instructed to make such inquiry as may be necessary concerning the powers of the Regents in granting special and local names to academic departments in union free school districts already incorporated under the general school laws of the State and also to report some plan which shall remove the confusion now existing in the use of corporate and local names. [Dec. 4, 1902]

The charter committee reported that according to present practice the application for admission of academic departments specifies clearly the corporate name, and that the certificate of admission is issued under such name; that to prevent confusion the local name of the academic department, as given in the application, is also inserted in the certificate. The committee reported further a prevalent custom of using as the local name of a school the name of a prominent individual (Wash-

ington Irving High School at Tarrytown, Peter Cooper High School of New York City, etc.) or benefactor (Parker Union School at Clarence, Haldane High School at Cold Spring, Rowena Memorial School at Palenville, etc.). It is also customary to continue the name of an academy adopted as the academic department of a union school (Canandaigua Academy at Canandaigua, S. S. Seward Institute at Florida, Delaware Literary Institute at Franklin, etc.), such continuation of the local name or of the old name of the academy aiding in identifying and protecting property rights in many cases. The certificate of admission is issued in the corporate name of the school and the local name is added as a means of further identification, the corporate name being unknown as a rule even to residents of the locality. [May 21, 1903]

Normal College of the City of New York. *Voted*, That the high school department of the Normal College of the City of New York be admitted to the University when the trustees have perfected their application by filing a duly attested resolution requesting such admission and stating that the student body is distinct and separate and that the high school department has also its separate faculty organization. [May 21, 1903]

Hudson River Institute. *Voted*, That, the Hudson River Institute having ceased to perform its educational work and its trustees having, as evidenced by their written certificate of June 20, 1902, unanimously consented that the Regents of the University may dissolve the said corporation, which they now contemplate doing; and it appearing that such corporation is indebted to several creditors and is insolvent; the Regents hereby direct that, in their behalf, the Attorney General be requested to apply to the court for the appointment of a receiver of the property of the said corporation, to liquidate its business affairs, and the Chancellor and secretary, or either, are hereby authorized to take such steps and execute in behalf of the Regents such papers as shall be needful therefor. [May 21, 1903]

Voted, That, the trustees of the Hudson River Institute, in anticipation of their desired dissolution of that corporation, having conveyed to the Regents of the University all of the prop-

erty of the said corporation, by a deed dated June 23, 1902, and recorded, at the instance of the said trustees, in the clerk's office of Columbia county in this State, on June 24, 1902, in liber 118 of deeds, at page 398; which deed the Regents never authorized to be made to them and the conveyance attempted thereby they have never consented to accept; and the said deed constituting on the said record an apparent cloud on the title to the property of the said corporation; and the dissolution of such corporation being now contemplated by the Regents, and they having directed the taking of steps for the appointment of a receiver to liquidate its business affairs; the Chancellor and the secretary of the Board of Regents are hereby authorized and directed to execute, in the name and behalf of the Regents of the University, such instrument, or instruments, of release and quitclaim of all interest in the property of the said corporation which purported to be conveyed to the Regents by the aforesaid deed, as the Attorney General shall advise to be needful to remove the said cloud on the title to the said property and facilitate and confirm any sale thereof by its duly appointed receiver. [May 21, 1903]

The following action was taken on motion of the Vice Chancellor:

St Regis Falls Union School. *Voted*, That St Regis Falls Union School receive the \$100 quota and \$65.03 for attendance for the year 1902, as its failure to report 175 days in session was due to the fact that the school was closed by order of the board of health. [May 21, 1903]

Name changed. On unanimous request of the trustees,
Voted, That under authority of §29 of the University law, the name of Charbonneau Institute, Rouse Point, be changed to St Patrick's Academic School of Rouse Point... [May 21, 1903]

The following unanimous action was taken on motion of Regent Fitch:

Normal College of the City of New York. As the Normal College of the City of New York has at all times been an integral part of the University of the State of New York and has fully complied

with the laws, ordinances, bylaws and regulations of the University, and

As the records of this department show that said college has conducted for years academic work or courses of study which entitle it on proper application to share in the funds distributable under the provisions of the Horton law, and which have been subject to the inspection and regulation of this board,

Voted, That the high school department of the Normal College of the City of New York be allowed to participate in the next annual apportionment, and that it be certified to the comptroller as entitled to such grant. [June 29, 1903]

STATISTICS OF SECONDARY SCHOOLS

Growth. June 30, 1903, there were on the University roll 636 academic departments of public schools and 144 chartered academies, making a total of 780 institutions of secondary education, being an increase of 14 over the number reported in 1902. During the year 16 academic departments have been admitted; of these Delhi Union School has leased the Delaware Academy, Franklin Union School the Delaware Literary Institute and Elbridge Union School the Munro Collegiate Institute, these three academic departments thus becoming the successors of the three academies named.

During the year the number of full high schools has increased 20, of senior schools 17; the number of middle schools has decreased 9 and the number of junior schools 12. Of the schools admitted during the year, 11 were of junior grade, 1 of senior grade and 3 of high school grade at the time of admission. It appears that 23 schools have advanced from junior to middle grade, 32 from middle to senior and 17 from senior to high school, a total of 72 advanced in grade during the year.

In 1902-3, 4 academies have been incorporated with permanent charters.

Expenditures. In 1902 the amount expended by 621 high schools was \$4,445,083.17, an average of \$57.34 for each student, an increase of \$6.37. In 1903 the amount expended by 636 high

schools was \$5,007,055.02, an average of \$61.73 for each student, an increase of \$4.39 for each student over the average in 1902.

In 1902 the 145 academies expended \$2,182,625.49, or an average of \$151.93 for each student, a decrease of \$2.52. In 1903 the 144 academies expended \$2,099,944.88, an average of \$146.25 for each student enrolled, a decrease of \$5.68.

The expenditures of all secondary schools taken together were \$72.37 for each student in 1902 and \$74.74 in 1903, an increase of \$2.37.

Students. The number of students instructed in the secondary schools of the State in 1903 was 95,096, an increase of 3513, or 3.8%, over the preceding year.

The whole number of graduates holding four year or higher credentials is 6654, a decrease of 136, or 2%, over the preceding year. The whole number of graduates is about 7% of the whole number attending and indicates therefore that about 28% of all the students attending secondary schools in the University complete four year courses of study.

The number of advanced diplomas and certificates issued was 2287, a decrease of 5.8% over the preceding year.

The table of academic credentials issued in 1903 shows that the biennial fluctuations in the number of preliminary certificates issued continues, the tendency to a decrease in the odd years and to an increase in the even years being maintained. The decrease in number of such certificates issued in 1903 as compared with 1902, was 1173, or 5.8%. The number of first year certificates decreased 501 or 4.7%. The number of second year certificates increased 110, and of third year certificates 128. Only 59 fourth year certificates and only 26 advanced certificates were issued, indicating that practically all of those who remain for a full four year course arrange their work along definite lines leading to a diploma instead of a certificate.

The whole number of academic diplomas and fourth year certificates issued was 4367, which is 27.1% of the number of preliminary certificates issued in 1899, indicating that in schools taking Regents examinations 27.1% of those who completed the grammar school course in 1899 remained to graduate in 1903.

EXAMINATIONS

The number of examination papers written, claimed, allowed, with honors attained in each subject is shown in table E [p. r40]. It will be noted that this number is somewhat less than in the preceding year.

For some years the work of the schools in mathematics has been criticized on the ground that students were unable to make ordinary computations with accuracy. In an endeavor to produce improvement in this direction the following instructions regarding the rating of papers in mathematics were issued Sep. 24, 1902:

Mathematics. For the purpose of securing a higher degree of accuracy in all papers in mathematics, the following rules will hereafter be observed in rating such papers in the Regents office:

- 1 In business arithmetic nothing will be allowed for an incorrect answer.
- 2 In all other papers in mathematics not more than 70% of the full value of any answer will be allowed if the answer is incorrect.
- 3 Deductions will be made for lack of neatness and orderly arrangement of work, specially in the computations in trigonometry.

The effect of this notice has already been evident. And, while there is still room for improvement, it is apparent that more attention is being given to accuracy of computation and neatness of work.

Of the 84 subjects and divisions of subjects in which examinations were held, 54 show decreases in number of papers allowed and 30 show increases. All Greek papers show a decrease of 222 or 13.2%. All Latin papers show an increase of 363 or 2%. There is a total decrease of 1028 papers or 11% in German and of 194 papers or 4.4% in French. While it is not safe to base any general conclusions on the increases or decreases of a single year, these figures would seem to indicate a growing tendency toward the study of Latin to the exclusion of other foreign languages.

The table shows that 539,241 papers were written, 418,230 claimed and 358,015 allowed, and of the latter 77,080 were honor papers standing at 90% or over.

Grants to secondary schools. The amounts apportioned to secondary schools in the University for the fiscal year ending Sep. 30, 1903, were as follows:

For \$100 quota	\$63 900 ..
Attendance	208 260 59
Books and apparatus.....	40 197 70
	\$312 358 29
Cost of inspection, travel and incidental expenses (1902-3)	32 983 52
	\$345 341 81

In making these grants, the State has continued to recognize the importance of fostering secondary education. As a result of such aid, secondary education has been brought within the reach of many students who would otherwise have been deprived of all instruction beyond the elementary schools.

The amount paid to denominational schools that submit to Regents examinations and inspection to meet local expenses of such examinations and inspection under the Constitution and laws of the State as interpreted by the Attorney General, was \$10,808.16 for the fiscal year ending Sep. 30, 1903, as compared with \$11,317.02 for the fiscal year ending Sep. 30, 1902.

All grants to secondary schools are made as soon as possible after the end of each fiscal year and are based on the report of that year. For example, in October 1903 were made all grants to secondary schools based on reports for the fiscal year ending Sep. 30, 1903, and no further grants are due till October 1904.

INSPECTION

The number of visits of inspection made by each of the inspectors is shown in table H, p. r41 of the appendix; and, in addition, are shown the educational meetings at which inspectors have been present and assisted.

Approval of laboratory courses. Sep. 24, 1902, the following instructions regarding laboratory courses in science were sent to all secondary schools in the University.

An allowance of 20 credits toward examinations in botany, zoology, physics and chemistry will be made to those students who have completed approved laboratory courses. Because of the frequent changes in teachers, equipment and numbers in class, approval of laboratory courses is made for one year only. In all cases where approval is desired for the current year, the inclosed blank should be filled out and returned to the Regents office not later than Oct. 15.

As soon as practicable after a request for approval is received, the school will be inspected. The inspector will consider (1) equipment of the laboratory, (2) special qualifications of the teacher, (3) course pursued, (4) time spent in the work, (5) notebooks kept by students. If the course is satisfactory in all these respects, a certificate of approval will be sent from the Regents office to the principal of the school, after the receipt of which students certified by the principal as having completed the course satisfactorily will be granted the allowance of 20 credits. Unless this certificate of approval has been received by the principal, all students should be instructed to answer 10 questions at each examination.

The student, at the time of performing the experiment, should enter in the notebook (1) number or title of experiment, (2) object sought, (3) apparatus and materials used, (4) operations, (5) observations, (6) deductions. The teacher should review, noting by conventional signs, errors and omissions. The student should make corrections, leaving original entries legible, after which the teacher should mark each experiment approved.

No allowance of less than 20 credits will be made on any examination paper. A candidate taking both parts of physics or of chemistry in one paper can not receive credit for laboratory work in one part only. Credit will not be given for a year's laboratory work done in a half year's time.

An approved laboratory course must consist of at least 70 exercises for each year (35 for each half year) of at least 40 minutes each, and the school must provide adequate facilities and supervision for individual work. It is expected that the teacher will be present during the entire time of the required laboratory exercises.

A purely textbook course demands from the student five periods for recitation and not less than five periods for study, making a minimum of 10 periods each week. Therefore, in order that a laboratory course may be approved, provision must be made for at least 10 40 minute periods each week, to be estimated by adding to the number of actual laboratory periods twice the number of actual recitation periods.

The minimum equipment that should be provided before application for approval, is indicated below:

Botany and zoology

- 1 A dissecting microscope for each student.
- 2 A compound microscope for each group of four students.
- 3 A set of microscopic mounts adapted to the course.

4 A set of charts adapted to the course—in zoology, charts illustrative of the frog, perch, mussel, crayfish, earthworm, hydra, starfish, infusoria and animalcula; and in botany, charts illustrative of fresh-water algae, mucor, moss, fern, pine, pea, horse-chestnut, strawberry, buttercup and violet. Other charts may be substituted for the last five in botany.

Physics and chemistry

Table space supplied if possible with running water and gas, and apparatus and supplies sufficient to enable each student, working in a group of not more than two, to perform each experiment of a course substantially equivalent to that outlined in the syllabus.

Apparatus. The services of an inspector of apparatus may be had as far as practicable in accordance with the following terms; i. e. two days service without charge, all time in excess of two days to be charged at the rate of \$5 a day.

The whole number of applications for approval of laboratory courses under these regulations, the number approved and the number failing to meet the conditions are as follows:

	Physics	Chemistry	Botany	Zoology	Total
No. applications	132	106	59	32	329
No. approved	105	88	46	22	261
No. failing of approval..	27	18	13	10	68

There was an increase over the previous year of 51 or 18½% in the number of applications, and of 15 or 6% in the number of approvals. These figures, though interesting, give only an imperfect conception of the improvement that has been wrought in the teaching of these four sciences as a result of approval of laboratory work and the giving of credit for such work on Regents credentials. Among the evident effects of this approval are the following: better rooms for laboratories, better facilities for individual work, insistence on the preparation of good notebooks by the students and adequate supervision of the work while it is in progress. Large expenditures have often been made to meet the requirements in these respects, specially to provide larger and better rooms and additional teachers.

In a system of examinations like those conducted by the Regents, where the questions are prepared and the answers rated by persons other than the teachers, it is essential that this work should be done, or at least directed, by those who are in direct and

frequent contact with the schoolroom. Any system of examinations that fails to recognize this fundamental principle will sooner or later fail. Recognizing this fact, the inspectors of the Regents office have been asked, as in former years, to prepare examination questions and to direct the rating of the answer papers. At the close of each examination the inspectors have been regularly called to the office, where each takes charge of the work of a department and superintends the rating of all papers in such department. Uniformity of rating is thus secured, but more important still is the rating in sympathy with the conditions that actually exist and which the inspector sees daily when engaged in visiting the schools. Each of the inspectors has spent about three months during the year in this work at the Regents office. In estimating the value that is to be given to the work of a student in one of our high schools three factors are therefore involved, viz: inspection, examination and certification. The inspection should determine whether the work is being carried on under suitable conditions and by competent teachers; the examination, controlled largely, as has been shown above, by the inspectors, should determine something of the student's power to think and ability to express himself; and the principal's certificate to the examination report should be a certificate that in his judgment the student has done work that should entitle him to credit. Our inspection force has been so small that usually only one full visit to a school has been possible each year. It is believed that double the number of visits would be profitable.

Grading of secondary schools. Feb. 8, 1894, the Regents took action regarding the classifying of the secondary schools in the University and established four grades, high school, senior school, middle school and junior school. Since that date there have been admitted to the University 20 high schools, 5 senior schools, 18 middle schools and 302 junior schools. The tables show that there are now in the University 393 high schools, 54 senior schools, 60 middle schools and 126 junior schools. The first grading of the entire list was made in 1896, when it was found that of the schools of the University previous to Feb. 8, 1894, 220 were of

high school grade, 22 of senior grade, 33 of middle grade and 19 of junior grade. Adding these numbers to the number in each grade admitted since Feb. 8, 1894, we find that, had there been no advance in grade, we should now have 240 high schools, 27 senior schools, 51 middle schools and 321 junior schools. Comparing these numbers with the present numbers in each grade, we find

	High	Senior	Middle	Junior
Previous to Feb. 8, 1894.....	220	22	33	19
Admitted since Feb. 8, 1894....	20	5	18	302
Total	240	27	51	321
¹ Present number	393	54	60	126
	<u>+153</u>	<u>+27</u>	<u>+9</u>	<u>-195</u>

It was the expectation of the Regents that the schools admitted of junior grade would rapidly improve as a result of influence of inspection, examination and slight financial aid. That this expectation has been fully realized and the action of the Regents in this matter fully justified, is shown by the figures given above. In fact it may be stated without fear of successful contradiction that no money ever expended by this State in aid of education has borne fruit so abundantly as has this; for, had these little schools not been thus encouraged, it is safe to assert that a large part of the State would still be without high school facilities, and thousands of young people would have been deprived of all opportunity of securing a high school education. Free tuition aids only those who are able to reach the schools giving it, and is only a small item in the cost of attendance at a high school. Unless the school is near at hand, the cost of board and of transportation is still prohibitive to a large number, even though the State pays the small item of tuition fees.

Though public high schools have been widely established as a result of the policy adopted by the Regents in 1894, there are still, and must always be, some sections remote from such schools, and

¹Three special institutions not included in the above.

for the benefit of students living in such localities the academies still offer the best advantages and are a necessary supplement to the public high schools. Such academies are really a part of the public school system and should not be confounded with private schools. They usually offer board and rooms at moderate rates and provide a much needed supervision over the students outside the regular school hours. Their place in the system is an important one and should be fully recognized.

The policy of State aid to secondary education, both by assisting in the support of secondary schools and by paying the academic tuition of students to whom free tuition is not otherwise available, is well established. As early as 1871 the Regents advocated State aid in payment of nonresident academic tuition, and a convocation committee was appointed to secure favorable legislation. This resulted in the enactment of ch.642, laws of 1873, which authorized the Regents to pay the tuition of nonresident academic students in academies and academic departments of union free schools, and made an appropriation therefor. No further appropriation was made for this purpose, however, till 1903, though the academic fund has always operated to lower the tuition charges to a point below the actual cost to the school. Of all the academic students found in the village schools 27% are nonresidents. The following table shows the geographic distribution of nonresident students in 1903.

Division of nonresident secondary students

	High schools	Academies	Total
Greater New York.....	64	349	413
Other cities.....	1 459	329	1 788
Rural districts.....	2 131	235	2 366
Incorporated villages.....	7 515	819	8 334
	11 169	1 732	12 901

If the high schools received \$20 from the State for each nonresident in attendance, the cost to the State would be \$223,380. If we add also the 1732 academy students at the same rate, the

additional cost to the State would be \$34,640, making the total cost to the State \$258,020. But, as a considerable proportion of both classes of students attend only a part of the year, and some reside either outside the State or in districts which maintain free high schools, the state provision necessary at this rate to make academic instruction free to eligible students will fall far below this figure. This is shown clearly by approved applications for free tuition for the first semester under the new law [ch.542, laws of 1903], which include only 5826 nonresident students, making a total cost to the State at the maximum rate of \$58,260 for the half year. That tuition is not claimed for a larger number of the nonresident students is due also to some extent to the fact that the rate is not sufficient to cover the cost, and to the fact that academies are excluded from the benefits of the act, and that many academic departments have not received the approval of the Superintendent of Public Instruction.

The incorporated villages with an aggregate population in 1900 of only 709,592 are educating 65% of the nonresident academic students, the rural districts 18%, the cities other than Greater New York 14% and Greater New York 3%. These figures, taken in connection with the fact stated above, that the tuition charges are below cost, suggest the part borne by the incorporated villages in providing secondary education. This is shown more clearly by the following table.

	Population (census 1900)	Secondary school students	Ratio
New York State.....	7 268 012	94 714	.013
Rural districts.....	1 611 590	8 266	.0051
New York city.....	3 437 202	27 407	.008
Other cities.....	1 509 628	28 385	.019
Incorporated villages.....	709 592	30 656	.043

The value of free tuition to nonresident students depends on the nearness to their homes of the schools offering such free tuition. The great increase in secondary schools since 1894 has brought these schools within the reach of practically all the children of the State.

The Legislature of 1903 in the closing hours of its session provided for the payment at State expense of academic tuition for students residing in districts where free academic instruction is not provided by the local authorities.

Under date of Sep. 5, 1903, the following circular was issued by order of the Chancellor of the University. (In this reprint the lists of schools are corrected to Jan. 21, 1904.)

To the Principal

Following are the academic schools fully approved both by the Superintendent of Public Instruction and by the Chancellor of the University, pursuant to laws of 1903, chapter 542. Supplementary lists of such additional schools as may meet all requirements of both departments will be issued later.

High schools

Adams High School	Bolivar High School
Addison High School	Boonville High School
Afton High School	Brasher Falls (Brasher and Stockholm High School)
Akron High School	Brewster High School
Albion High School	Bridgewater High School
Alexandria Bay High School	Brocton High School
Alfred Union School	Brookfield High School
Allegany High School	Brownville High School
Almond High School	Brushton High School
Amityville High School	Caledonia High School
Andes High School	Cambridge High School
Andover High School	Camden High School
Angelica (Wilson Academy)	Canajoharie High School
Angola High School	Canandaigua Academy
Antwerp High School	Canastota High School
Arcade High School	Candor High School
Argyle High School	Canisteo High School
Attica High School	Canton High School
Avoca High School	Cape Vincent High School
Babylon High School	Carthage High School
Bainbridge High School	Castile High School
Baldwinsville High School	Catskill Free Academy
Ballston Spa High School	Cattaraugus High School
Batavia High School	Central Square High School
Bath (Haverling High School)	Charlotte High School
Bay Shore High School	Chateaugay High School
Belfast High School	Chatham High School
Belmont High School	Cherry Creek High School
Bergen High School	

Cherry Valley High School	Forestville Free Academy
Chester High School	Fort Covington Free Academy
Chittenango (Yates High School)	Fort Edward High School
Churchville High School	Fort Plain High School
Clarence (Parker High School)	Frankfort High School
Clayton High School	Franklin (Delaware Literary Institute and Union School)
Clayville High School	Freeport High School
Clifton Springs High School	Frewsburg High School
Clinton High School	Friendship High School
Clyde High School	Fultonville High School
Cobleskill High School	Gilbertsville High School
Cohocton High School	Glen Cove High School
Cold Spring (Haldane High School)	Glens Falls High School
Cooperstown High School	Goshen High School
Copenhagen High School	Gouverneur High School
Corinth High School	Gowanda High School
Cornwall-on-Hudson High School	Granville High School
Coxsackie High School	Great Neck High School
Cuba High School	Greene High School
Dansville High School	Greenport High School
Delevan High School	Greenwich High School
Delhi (Delaware Academy and Union School)	Groton High School
Deposit High School	Hamburg High School
De Ruyter High School	Hamilton High School
Dexter High School	Hammondsport High School
Dolgeville High School	Hancock High School
Dryden High School	Haverstraw High School
Dundee High School	Hempstead High School
Earlville High School	Ilerkimer High School
East Aurora High School	Highland Falls High School
East Bloomfield High School	Hilton High School
East Syracuse High School	Hobart High School
Edmeston High School	Holland Patent High School
Elizabethtown High School	Holley High School
Ellenville High School	Homer Academy and Union School
Ellicottville High School	Honeoye Falls High School
Ellington High School	Hoosick Falls High School
Fabius High School	Horseheads High School
Fairport High School	Huntington High School
Falconer High School	Ilion High School
Fayetteville High School	Jamesville High School
Fillmore High School	Jefferson High School
Fishkill-on-Hudson High School	Jordan Free Academy
Fonda High School	Keeseville High School

Kinderhook High School
 Lake Placid High School
 Lakewood High School
 Lancaster High School
 Lawrence High School
 Le Roy High School
 Lestershire High School
 Liberty High School
 Limestone High School
 Little Valley High School
 Livonia High School
 Luzerne High School
 Lyndonville High School
 Lyons High School
 Lyons Falls High School
 Macedon High School
 Madrid High School
 Malone (Franklin Academy)
 Mamaroneck High School
 Manlius High School
 Marathon High School
 Marcellus High School
 Margaretville High School
 Massena High School
 Matteawan High School
 Mayville High School
 Mechanicville High School
 Medina High School
 Mexico Academy and High School
 Middleburg High School
 Middleport High School
 Milford High School
 Millbrook Memorial School
 Millerton High School
 Mohawk High School
 Montgomery High School
 Monticello High School
 Moravia High School
 Morris High School
 Morrisville High School
 Mt Kisco High School
 Mt Morris High School
 Naples High School
 New Berlin High School
 New Hartford High School
 Newark High School

Newark Valley High School
 Newport High School
 North Cohocton and Atlanta Union
 High School
 North Collins High School
 Northport High School
 Norwich High School
 Norwood High School
 Nunda High School
 Nyack High School
 Oakfield High School
 Oneonta High School
 Onondaga Free Academy
 Ontario High School
 Orchard Park High School
 Ossining High School
 Otego High School
 Ovid High School
 Owego Free Academy
 Oxford Academy and Union School
 Oyster Bay High School
 Palmyra Classical High School
 Parish High School
 Patchogue High School
 Pawling High School
 Peekskill (Drum Hill High School,
 Oaksdale High School)
 Penn Yan Academy
 Perry High School
 Phelps Union and Classical School
 Philadelphia High School
 Phoenix High School
 Piermont (Tappan Zee High School)
 Pike Seminary
 Pine Plains (Seymour Smith Acad-
 emy)
 Pittsford High School
 Port Byron High School
 Port Chester High School
 Port Henry High School
 Port Jervis High School
 Port Leyden High School
 Potsdam High School
 Prattsburg (Franklin Academy and
 High School)
 Pulaski Academy and Union School

Ravena High School	Stony Point High School
Remsen High School	Tarrytown (Washington Irving High School)
Rhinebeck High School	Theresa High School
Richfield Springs High School	Ticonderoga High School
Ripley High School	Tonawanda High School
Riverhead High School	Trumansburg High School
Rockville Center (South Side High School)	Tully High School
Rouse's Point High School	Tupper Lake High School
Rushford High School	Unadilla High School
Sacket High School	Union High School
St Johnsville High School	Union Springs High School
Salamanca High School	Valatie High School
Sandy Creek High School	Valley Falls High School
Sandy Hill High School	Vernon High School
Saranac Lake High School	Victor High School
Saratoga Springs High School	Walden High School
Saugerties High School	Walton High School
Savannah High School	Warner High School
Sayville High School	Warrensburg High School
Schaghticoke High School	Warsaw High School
Schenevus High School	Warwick Institute
Schoharie High School	Waterford High School
Schuylerville High School	Waterloo High School
Seacliff High School	Watkins High School
Seneca Falls (Mynderse Academy)	Waverly High School
Sharon Springs High School	Wayland High School
Sherburne High School	Webster High School
Sherman High School	Weedsport High School
Shortsville High School	Wellsville High School
Sidney High School	West Winfield High School
Silver Creek High School	Westfield Academy and Union School
Silver Springs High School	Westport High School
Sinclairville High School	White Plains High School
Skaneateles High School	Whitehall High School
Solvay High School	Whitney's Point High School
South Glens Falls High School	Williamson High School
Southampton High School	Williamsville High School
Spencer High School	Willsborough High School
Spencerport High School	Wilson High School
Spring Valley High School	Windsor High School
Springville (Griffith Institute and Union School)	Wolcott (Leavenworth Institute and Wolcott High School)
Stamford Seminary and Union School	Worcester High School
Stillwater High School	Wyoming (Middlebury Academy and Union School)

All public schools in the University of full high school grade in the cities of the State are also to be included in the above list.

The Chancellor has approved all academic schools in the University that meet the Regents requirements to the extent indicated by the grade in each case; namely, high schools for four years, senior schools for three years, middle schools for two years and junior schools for one year; but all schools approved both by the Superintendent of Public Instruction and by the Chancellor are approved without limitation for the current year. Grades will be advanced whenever satisfactory evidence is submitted that the Regents requirements have been met. In all cases tuition should be paid by the State only to the extent to which adequate instruction is given and suitable accommodations are provided.

The following senior schools reported by the Superintendent as having met all his requirements are approved by the Chancellor to receive non-resident students for three years of high school instruction:

Senior schools

Alden Union School	Liverpool Union School
Alexander Union School	Ludlowville Union School
Altmar Union School	McGrawville Union School
Arkport Union School	Machias Union School
Athens Union School	Madison Union School
Black River Union School	Middle Granville Union School
Caldwell (Lake George Union School)	Moirra Union School
Canaseraga Union School	Morristown Union School
Carmel Union School	Newfield Union School
Champlain Union School	Oriskany Falls Union School
Cleveland Union School	Painted Post Union School
Constableville Union School	Patterson Union School
Crown Point Union School	Pompey Union School
Dalton Union School	Portville Union School
East Hampton Union School	Richburg Union School
East Randolph Union School	Round Lake Union School
Eldridge Union School and Academy	Rye Union School
Fair Haven Union School	St Regis Falls Union School
Farmer Union School	Savona Union School
Fort Ann Union School	Scottsville Union School
Guilford Union School	Shelter Island Union School
Hannibal Union School	Sodus Union School
Harrisville Union School	Springfield Center Union School
Hermon Union School	Turin Union School
Honeoye Union School	Van Etten Union School
Leonardsville Union School	Whitesville Union School

The following middle schools reported by the Superintendent of Public Instruction as having met all his requirements are approved by the Chancellor for two years of high school instruction :

Middle schools

Altamont Union School	Lysander Union School
Ausable Forks Union School	Middleville Union School
Baldwin Union School	Monroe Union School
Buchanan Union School	Munnsville Union School
Camillus Union School	Nichols Union School
Cato Union School	North Tarrytown Union School
Cincinnatus Union School	Northville Union School
Collins Center Union School	Oriskany Union School
Corfu Union School	Panama Union School
East Pembroke Union School	Redwood Union School
Eden Union School	Roxbury Union School
Elmira Heights Union School	Rushville Union School
Florida (S. S. Seward Institute)	South New Berlin Union School
Freeville Union School	Southold Union School
Greenville Free Academy	Three Mile Bay Union School
Greenwood Union School	Tuckahoe (Waverly Union School)
Hartwick Union School	Verona Union School
Heuvelton Union School	Waterport Union School
Holland Union School	Youngstown Union School
Lisle Union School	

The following junior schools reported by the Superintendent of Public Instruction as having met all his requirements are approved by the Chancellor for one year of high school instruction :

Junior schools

Amenia Union School	Lafargeville Union School
Breesport Union School	La Fayette Union School
Broadalbin Union School	Lewiston Union School
Cayuga Union School	Livingston Manor Union School
Chautauqua Union School	Longlake Union School
Chenango Forks Union School	Manchester Union School
Coeymans Union School	New York Mills Union School No. 2
Colton Union School	Northcreek Union School
Easton Union School	Parishville Union School
Elba Union School	Philmont Union School
Gainesville Union School	Pleasantville Union School
Gardenville Union School	Poland Union School
Great Valley Union School	Port Washington Union School
Hammond Union School	Red Creek Union Seminary
Hunter Union School	Rensselaer Falls Union School

Richmondville Union School	Stockton Union School
Richville Union School	Suffern Union School
Roscoe Union School	Turner Union School
Sauquoit Union School	Waddington Union School
Schroon Lake Union School	Walworth Academy
Schuyler's Lake Union School	West Hebron Union School
Sloan Union School	Windham Union School
Smyrna Union School	Woodhull Union School
South Dayton Union School	

The following school reported by the Superintendent of Public Instruction as having met all his requirements is not yet approved by the Chancellor:

Westmoreland Union School

The following are approved by the Chancellor, but are not found on the list submitted by the Superintendent of Public Instruction:

High schools

Avon High School	Lynbrook High School
Cazenovia Union School (laws 1902, ch. 325)	Mineville High School
Cornwall High School	Port Jefferson High School
Dobbs Ferry High School	Sag Harbor High School
Irvington High School	Waterville High School
Islip High School	Whitesboro High School

Senior schools

Bayport Union School	Palatine Bridge Union School
Eaton Union School	Tivoli Union School
Mumford Union School	Truxton Union School

Middle schools

Allentown Union School	North Bangor Union School
Fishkill Union School	North Brookfield Union School
Hinsdale Union School	Orient Union School
Hyde Park Union School	Palenville (Rowena Memorial School)
Katonah Union School	Red Hook Union School
Knowlesville Union School	South Byron Union School
Marlboro Union School	Washingtonville Union School
Mt Upton Union School	

Junior schools

Adams Center Union School	Bombay Union School
Apalachin Union School	Bradford Union School
Berkshire Union School	Brier Hill Union School
Berlin Union School	Burdett Union School
<i>Bloomington</i> dale Union School	Callicoon Depot Union School

Campbell Union School	McLean Union School
Center Moriches Union School	Mayfield Union School
Central Valley Union School	Meridian Union School
Chaumont Union School	Moscow Union School
Clymer Union School	New Woodstock Union School
Dayton Union School	North Lawrence Union School
Depew Union School	Oakdale Station (Oakdale Union School)
East Islip Union School	Ocean Side Union School
East Rockaway Union School	Orwell Union School
East Worcester Union School	Penfield Union School
Edwards Union School	Peterboro Union School
Erieville Union School	Plainville Union School
Essex Union School	Randolph Union School
Forestport Union School	Smithville Union School
Freedom Union School	South Otselic Union School
Galway Union School	Stonybrook Union School
Georgetown Union School	Tioga Center Union School
Groveland Union School	Troupsburg Union School
Hastings-on-Hudson (Fraser Union School)	Tuxedo Union School
Henderson Union School	Unadilla Forks Union School
Hicksville Union School	Wappingers Falls Union School
Highland Union School	West Carthage Union School
Hillsdale Union School	West Eaton Union School
Hinsdale (Maplehurst Union School)	Williamstown Union School
Knoxboro Union School	Woodmere Union School

The Chancellor included also in his list the nonsectarian academies, subject to the opinion of the Attorney General that they could properly be included under the terms of the law. That these nonsectarian academies should be included, as they are in other states, is manifest from the fact that for more than a century the Legislature has appropriated annually funds for their maintenance, and since the establishment of the public high schools the academies have shared equally with them in all state grants for secondary education.

The Chancellor believes also that students living in districts with schools maintaining an approved academic course of less than four years should be allowed to complete the remaining years of the high school course in other approved schools; otherwise, owing to geographic and other conditions, many entitled to receive free tuition for a full high school course will not be able to avail themselves of this privilege. But the Attorney General holds that the wording of laws of 1903, chapter 542 clearly forbids this construction inasmuch as "academic department" in this statute is not modified and therefore includes every such department established by a board of education and admitted by the Regents of the University, regardless of the extent of its course of study.

These defects in the law should be remedied at this session of the Legislature.

Students entitled to the benefits of this act must meet the following conditions:

1 Must reside in a district of New York State which does not maintain an academic department and which does not contract under laws of 1903, chapter 265 with another district maintaining an academic department. The Chancellor will regard schools not meeting University standards as not maintaining an academic department.

2 Must hold a Regents preliminary certificate or a ninth grade certificate signed by the State Superintendent or have a preliminary education approved by the State Superintendent and the Chancellor as fully equivalent. (To avoid any disappointment such approval should be secured as early as practicable.)

3 Must not be members of a teachers training class or a training school, for whose tuition therein the State has made other provision.

4 Must attend an approved school for a period of not less than eight weeks.

Schools receiving nonresident pupils at state expense under this act must meet the following conditions:

1 Maintain an academic department.

2 Maintain a course of study approved by the State Superintendent of Public Instruction and by the Chancellor of the University.

3 Make no further charge for the tuition of such students as receive nonresident tuition at state expense.

This circular supplements information previously given and should be preserved for reference.

By order of the Chancellor

JAMES RUSSELL PARSONS JR

Secretary

In January 1904 the Superintendent of Public Instruction and the Chancellor of the University jointly issued the following:

REGULATIONS GOVERNING THE PAYMENT OF NONRESIDENT TUITION

Under laws of 1903, ch. 542

CHARLES R. SKINNER, State Superintendent of Public Instruction

WILLIAM CROSWELL DOANE, Chancellor of University of the State of New York

Albany N. Y.

1904

I, Charles R. Skinner, State Superintendent of Public Instruction, and I, William Croswell Doane, Chancellor of the University of the State of New York, have jointly established the following rules and regulations regarding the payment of the tuition of nonresident academic pupils pursuant to chapter 542 of the laws of 1903.

CHARLES R. SKINNER

State Superintendent

WM CROSWELL DOANE

Chancellor

1 The board of education of each school under this act is to make out a claim in duplicate and file one copy with the State Superintendent of Public Instruction and the other with the Chancellor of the University.

2 The claim is to be presented promptly at the close of each semester on blank forms provided for that purpose. Certification will be made to the Comptroller as soon as the claims can be audited.

3 The State Superintendent of Public Instruction and the Chancellor of the University shall jointly pass on the eligibility of all students claimed.

4 A Regents preliminary certificate, a ninth grade certificate issued by the State Superintendent of Public Instruction, any teacher's license issued under the authority of the State Superintendent of Public Instruction, except a temporary or special license, or any other credential covering the elementary subjects accepted by these authorities as equivalent to any credential named above shall entitle the holder to the benefits of this act if other conditions are complied with.

5 The State Superintendent of Public Instruction and the Chancellor of the University shall jointly audit all claims for payment of tuition and certify the same to the Comptroller for the payment thereof.

The State Superintendent of Public Instruction and the Chancellor of the University have approved for the payment of nonresident tuition under chapter 542 of the laws of 1903 all the high schools in the cities of the State and the academic departments in the following villages:

Adams	Athens	Brocton
Addison	Attica	Brookfield
Afton	Ausable Forks	Brownville
Akron	Avoca	Brushton
Albion	Babylon	Buchanan
Alden	Bainbridge	Caldwell (Lake George)
Alexander	Baldwin	Caledonia
Alexandria Bay	Baldwinsville	Cambridge
Alfred	Ballston Spa	Camden
Allegany	Batavia	Camillus
Almond	Bath	Canajoharie
Altamont	Bay Shore	Canandalgwa
Altmar	Belfast	Canaseraga
Amenia	Belmont	Canastota
Amityville	Bergen	Candor
Andes	Black River	Canisteo
Andover *	Bolivar	Canton
Angelica	Boonville	Cape Vincent
Angola	Brasher	Carmel
Antwerp	Breesport	Carthage
Arcade	Brewster	Castile
Argyle	Bridgewater	Cato
Arkport	Broadalbin	Catskill

Cattaraugus	Dolgeville	Gilbertsville
Cayuga	Dryden	Glencove
Central Square	Dundee	Glens Falls
Champlain	Earlville	Goshen
Charlotte	East Aurora	Gouverneur
Chateaugay	East Bloomfield	Gowanda
Chatham	East Hampton	Granville
Chautauqua	East Pembroke	Great Neck
Chenango Forks	East Randolph	Great Valley
Cherry Creek	East Syracuse	Greene
Cherry Valley	Easton	Greenport
Chester	Eden	Greenville
Chittenango	Edmeston	Greenwich
Churchville	Elba	Greenwood
Cincinnatus	Elbridge	Groton
Clarence	Elizabethtown	Gullford
Clayton	Ellenville	Hamburg
Clayville	Ellicottville	Hamilton
Cleveland	Ellington	Hammond
Clifton Springs	Elmira Heights	Hammondsport
Clinton	Fabius	Hancock
Clyde	Fair Haven	Hannibal
Cobleskill	Fairport	Harrisville
Coeymans	Falconer	Hartwick
Cohocton	Farmer	Haverstraw
Cold Spring	Fayetteville	Hempstead
Collins Center	Fillmore	Herkimer
Colton	Fishkill Landing	Hermon
Constableville	Florida	Heuvelton
Cooperstown	Fonda	Highland Falls
Copenhagen	Forestville	Hilton
Corfu	Fort Ann	Hobart
Corinth	Fort Covington	Holland
Cornwall-on-Hudson	Fort Edward	Holland Patent
Coxsackie	Fort Plain	Holley
Crown Point	Frankfort	Homer
Cuba	Franklin	Honeoye
Dalton	Freeport	Honeoye Falls
Dansville	Freeville	Hoosick Falls
Delevan	Frewsburg	Horseheads
Delhi	Friendship	Hunter
Deposit	Fultonville	Huntington
De Ruyter	Gainesville	Ilion
Dexter	Gardenville	Jamesville

Jefferson	Medina	Orchard Park
Jordan	Mexico	Oriskany
Keeseville	Middle Granville	Oriskany Falls
Kinderhook	Middleburg	Ossining
Lafargeville	Middleport	Otego
Lafayette	Middleville	Ovid
Lake Placid	Millford	Owego
Lakewood	Millbrook	Oxford
Lancaster	Millerton	Oyster Bay
Lawrence	Mohawk	Painted Post
Leonardsville	Molra	Palmyra
Leroy	Monroe	Panama
Lestershire	Montgomery	Parish
Lewiston	Monticello	Parishville
Liberty	Moravia	Patchogue
Limestone	Morris	Patterson
Lisle	Morristown	Pawling
Little Valley	Morrisville	Peekskill { Drum Hill and Oaksdale
Liverpool	Mount Kisco	
Livingston Manor	Mount Morris	
Livonia	Munnsville	Penn Yan
Long Lake	Naples	Perry
Ludlowville	New Berlin	Phelps
Luzerne	New Hartford	Philadelphia
Lyndonville	New York Mills No. 2	Philmont
Lyon Falls	Newark	Phoenix
Lyons	Newark Valley	Piermont
Lysander	Newfield	Pike
Macedon	Newport	Pine Plains
McGrawville	Nichols	Pittsford
Machias	North Cohocton	Pleasantville
Madison	North Collins	Poland
Madrid	North Creek	Pompey
Malone	North Tarrytown	Port Byron
Mamaroneck	Northport	Port Chester
Manchester	Northville	Port Henry
Manlius	Norwich	Port Jervis
Marathon	Norwood	Port Leyden
Marcellus	Nunda	Port Washington
Margaretville	Nyack	Portville
Massena	Oakfield	Potsdam (No. 8)
Matteawan	Oneonta	Prattsburg
Mayville	Onondaga Valley	Pulaski
Mechanicville	Ontario	Ravena

Red Creek	Shelter Island	Valatie
Redwood	Sherburne	Valley Falls
Remsen	Sherman	Van Etten
Rensselaer Falls	Shortsville	Vernon
Rhinebeck	Sidney	Verona
Richburg	Silver Creek	Victor
Richfield Springs	Silver Springs	Waddington
Richmondville	Sinclairville	Walden
Richville	Skaneateles	Walton
Ripley	Sloan	Walworth
Riverhead	Smyrna	Warner
Rockville Center	Sodus	Warrensburg
Roscoe	Solvay	Warsaw
Round Lake	South Dayton	Warwick
Rouses Point	South Glens Falls	Waterford
Roxbury	South New Berlin	Waterloo
Rushford	Southampton	Waterport
Rushville	Southold	Watkins
Rye	Spencer	Waverly
Sacket Harbor	Spencerport	Wayland
St Johnsville	Spring Valley	Webster
St Regis Falls	Springfield Center	Weedsport
Salamanca	Springville	Wellsville
Sandy Creek	Stamford	West Hebron
Sandy Hill	Stillwater	West Winfield
Saranac Lake	Stockton	Westfield
Saratoga Springs	Stony Point	Westport
Saugerties	Suffern	White Plains
Sauquoit	Tarrytown	Whitehall
Savannah	Theresa	Whitesville
Savona	Three Mile Bay	Whitney Point
Sayville	Ticonderoga	Williamson
Schaghticoke	Tonawanda	Williamsville
Schenevus	Trumansburg	Willsboro
Schoharie	Tuckahoe	Wilson
Schroon Lake	Tully	Windham
Schuyler Lake	Tupper Lake	Windsor
Schuylerville	Turin	Wolcott
Scottsville	Turner	Woodhull
Sea Cliff	Unadilla	Worcester
Seneca Falls	Union	Wyoming
Sharon Spa	Union Springs	Youngstown

Nov. 1, 1903

STATEMENT OF CLAIM FOR NONRESIDENT TUITION

[Place].....[Date].....190

Claim for tuition of nonresident pupils instructed in union free school district no.....of the town of.....under the provisions of chapter 542 laws of 1903, between [date].....and [date].....

Three copies of this statement should be made immediately after the close of each semester; one should be sent to the Superintendent of Public Instruction and one to the Chancellor of the University and one should be retained by the school for reference.

DIRECTIONS

1 In filling out column 4 of the table, use the following abbreviations:

p for preliminary certificate

n For ninth grade certificate

1 for first grade certificate

2 for second grade certificate

3 for third grade certificate

t c for training class or training school certificate

eq for equivalent credential (which must be submitted with the statement)

In this column also give county and commissioner district in which teacher's certificate was earned and name of school in which preliminary certificate or ninth grade certificate was earned, if not earned in your school.

2 If the parents of any of the pupils are nonresident taxpayers of the district, state in each case the amount of the tax paid the current year, and the number and grade of pupils of this family in your school.

3 Report no nonresident who is a member of a teachers training class or a resident of a contracting district.

NO.	NAME OF PUPIL	HOME SCHOOL DISTRICT: NUMBER, TOWN AND COUNTY	CREDENTIAL ON WHICH PUPIL IS ADMITTED	NO. WEEKS REGISTERED	NO. DAYS ABSENT	REASONS FOR ABSENCE ¹

¹Under this head state whether or not the absence was due to good and sufficient reasons.

To.....

President Board of Education

I certify to the accuracy of the facts as presented above

.....

Principal

.....president of the board of education of
union free school district no.....of the town of.....
being duly sworn deposes and says that on investigation he finds that the
above record of nonresident pupils is true and correct and that all require-
ments relating to the course of study have been fully complied with; that
free tuition has been granted to these students in accordance with the pro-
vision of chapter 542, laws of 1903 and that.....
is the duly qualified treasurer of this district, his postoffice address being
.....

.....

Subscribed and sworn to before me, this.....

day of.....190

.....

SUMMARY OF APPENDIX

For the convenience of the reader, the tables and some other information have been transferred to the appendix. These are described briefly as follows:

A Secondary schools in the University 1893-1903, the decade's growth and average annual increase in the number of schools, faculty, students, net property, receipts and expenditures.

B Analysis of expenditures in secondary schools, the decade's growth and average annual increase.

C Secondary schools classified by grades, 1897-1903, with the number of students in each, the growth and average annual increase.

D Credentials issued in 1903.

E Summary of academic examinations 1893-1903.

F Summary of criticisms of question papers 1893-1903.

G Calendar of academic examinations.

H Summary of inspections, showing total number of visits made, to which is added a list of educational meetings participated in by each inspector.

I List of institutions having name changed in 1902-3.

J Summary of secondary schools chartered or admitted to the University in 1902-3. Permanent charters were granted to four academies, and certificates of admission were issued to 16 academic departments. The total net property of these institutions was \$839,631.62, the average net property \$41,981.58.

K Preliminary and academic studies table.

Respectfully submitted

JAMES RUSSELL PARSONS JR

Director

Regents Office, Albany N. Y.

Mar. 5, 1904

APPEN-

A SECONDARY SCHOOLS 1893-1903, THE

	1893	1894	1895	1896	1897
Number of schools					
High schools.....	285	314	373	421	465
Academies.....	125	123	131	128	119
Total.....	410	437	504	549	584
Faculty					
High schools.....	1 158	1 311	1 437	1 733	2 173
men.....	393	455	517	580	636
women.....	765	856	920	1 153	1 537
Academies.....	1 031	1 116	1 105	1 040	1 118
men.....	376	427	444	408	399
women.....	655	689	661	632	719
Total.....	2 189	2 427	2 542	2 773	3 291
Students					
High schools.....	29 668	34 058	38 717	42 210	43 916
boys.....	12 845	14 842	17 267	18 814	19 594
girls.....	17 823	19 216	21 450	23 396	24 322
Academies.....	12 131	10 978	11 220	10 273	9 548
boys.....	5 898	5 388	5 658	4 761	4 653
girls.....	6 233	5 590	5 562	5 512	4 895
Total.....	41 799	45 036	49 937	52 483	53 464
Net property					
High schools.....	\$6 519 517	\$7 340 728	\$7 506 655	\$7 464 234	\$7 667 883
Academies.....	8 193 063	8 712 532	10 062 338	15 841 548	15 493 519
Total.....	\$14 712 580	\$16 053 260	\$17 568 993	\$23 305 782	\$23 161 402
Receipts					
High schools.....				\$1 856 659	\$1 982 034
Academies.....				1 825 535	1 396 957
Total.....	\$2 877 425	\$3 324 686	\$3 143 825	\$3 682 194	\$3 328 991
Expenditures					
High schools.....	\$1 698 860	\$1 954 853	\$1 803 675	\$1 813 132	\$1 892 960
Academies.....	1 141 422	1 349 850	1 329 543	1 747 670	1 891 296
Total.....	\$2 840 282	\$3 304 703	\$3 133 218	\$3 560 802	\$3 284 246

DIX

DECADE'S GROWTH AND AVERAGE ANNUAL INCREASE

1898	1899	1900	1901	1902	1903	INCREASE	
						Decade	Aver. an.
514	541	565	595	621	636	351	35
131	134	140	146	145	144	19	2
645	675	705	741	766	780	370	37
2 293	2 545	2 783	3 063	3 236	3 506	2 348	235
781	888	999	1 055	1 120	1 157	764	76
1 512	1 657	1 844	1 998	2 116	2 349	1 584	158
223	1 046	1 105	1 213	1 245	1 288	257	26
373	401	430	483	509	509	133	13
620	645	675	730	736	779	124	12
3 286	3 591	3 888	4 266	4 481	4 794	2 605	261
55 075	59 632	66 929	70 560	77 515	81 108	51 440	5 144
23 482	25 362	28 515	30 360	32 965	34 024	21 679	2 168
31 598	34 270	38 414	40 200	44 550	47 084	29 761	2 976
11 232	10 144	12 722	13 636	14 366	14 359	2 228	223
5 260	4 861	5 721	5 968	6 213	6 098	200	20
6 022	5 283	7 001	7 648	8 153	8 261	2 028	203
66 357	69 776	79 365	83 796	91 583	95 096	53 297	5 330
\$9 339 536	\$10 496 416	\$11 124 461	\$10 738 383	\$11 619 389	\$14 400 278	\$7 880 761	\$788 076 10
16 508 084	16 856 991	17 287 724	18 150 206	19 106 318	19 370 728	11 177 665	1 117 766 50
\$25 847 570	\$27 353 407	\$28 412 185	\$28 888 589	\$30 725 707	\$33 771 006	\$19 058 426	\$1 905 842 60
\$2 286 512	\$1 993 964	\$4 140 224	\$3 863 200	\$4 444 695	\$5 105 810	b \$3 249 151	b \$464 164 43
1 604 861	1 610 065	2 056 368	2 235 167	2 454 264	2 200 314	b 374 779	b 53 539 86
\$3 891 393	\$3 604 029	\$6 196 592	\$6 158 367	\$6 896 959	\$7 306 124	\$4 428 699	\$442 869 90
\$2 239 226	\$3 706 196	\$4 077 421	\$3 596 674	\$4 445 083	\$5 007 055	\$3 306 195	\$330 819 50
1 490 687	1 518 629	2 018 954	2 106 044	2 182 625	2 099 945	958 523	95 852 30
\$3 729 913	\$5 226 825	\$6 096 375	\$5 702 718	\$6 627 708	\$7 107 000	\$4 266 718	\$426 671 80

a Excluding duplicates. b Growth and average for seven years.

B ANALYSIS OF EXPENDITURES OF SECONDARY SCHOOLS 1893-1903, THE DECADE'S GROWTH AND AVERAGE ANNUAL INCREASE

	1893	1894	1895	1896	1897	1898
Grounds	\$41 054 89	\$60 654 ..	\$48 998 82	\$45 126 87	\$24 097 78	\$31 757 61
Buildings	345 896 68	406 331 43	254 236 14	209 159 71	849 961 88	360 021 09
Furniture	49 017 18	53 760 26	89 138 69	49 014 53	48 993 40	60 819 88
Apparatus	23 946 ..	22 845 18	21 204 37	81 233 41	47 720 49	48 910 82
Libraries	89 508 27	41 979 41	41 519 11	48 598 63	45 321 ..	57 614 48
Museums	5 062 86	3 570 67	3 506 72	412 61	<i>b</i>	<i>b</i>
Salaries for instruction	1 400 967 22	1 651 166 75	1 692 539 89	1 858 951 56	1 757 708 55	1 988 720 10
Fees to teachers	93 810 90	45 343 19	41 489 62	27 438 61	30 353 98	27 149 28
Paid other officers and employees	150 337 45	161 981 22	169 842 05	200 838 57	197 977 60	212 461 88
Prizes, scholarships etc.	5 110 37	7 647 99	28 832 37	14 012 24	10 369 74	18 111 88
Given or lent to students	17 572 84	28 313 07	20 392 53	30 943 02	19 952 73	29 717 66
Interest on debts	75 044 08	89 330 17	105 073 21	66 753 89	57 481 52	71 966 53
Insurance	24 888 02	23 027 68	28 330 70	29 864 75	26 697 86	24 983 55
Fuel and lights	129 976 18	150 848 54	141 325 18	133 620 98	138 185 21	143 863 06
Other incidentals	81 050 29	37 945 05	41 134 76	38 860 57	44 272 89	46 284 65
All other purposes	407 089 44	519 958 52	465 653 97	674 183 02	490 152 55	623 581 06
Total	\$2 840 282 12	\$3 804 703 13	\$3 133 218 13	\$3 560 802 47	\$3 284 246 18	\$3 729 913 03

a Including \$12,300 which was not itemized. *b* Included under "all other purposes."

B ANALYSIS OF EXPENDITURES OF SECONDARY SCHOOLS 1899-1903, THE DECADE'S GROWTH AND AVERAGE ANNUAL INCREASE (concluded)

	1899	1900	1901	1902	1903	INCREASE	
						Decade	Average annual
Grounds	\$1 019 641 94	\$1 080 065 16	\$239 161 89	\$138 978 12	\$119 860 92	\$78 806 08	\$7 880 60
Buildings	304 781 22	515 829 55	676 454 81	1 117 159 10	1 291 648 49	945 751 81	94 575 18
Furniture	57 864 52	64 154 58	73 906 69	74 844 89	120 991 58	71 974 85	7 197 44
Apparatus	169 838 05	175 144 02	77 828 16	67 581 07	73 733 82	49 787 82	4 978 78
Libraries	57 264 86	56 097 94	58 544 24	54 052 52	76 894 94	87 386 67	8 788 67
Museums	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
Salaries for instruction	2 361 897 83	2 433 974 52	2 952 265 78	3 205 376 65	3 496 154 97	2 095 187 75	209 518 78
Fees to teachers	34 644 03	35 598 29	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Paid other officers and employees	223 623 92	245 916 60	232 753 84	296 726 74	359 500 42	209 162 97	20 916 30
Prizes, scholarships etc.	12 702 67	14 743 56	19 794 17	26 214 65	32 010 65	26 900 28	2 690 08
Given or lent to students	36 792 09	36 856 04	37 789 73	31 539 89	23 546 59	5 973 75	597 38
Interest on debts	90 363 99	102 605 45	130 232 15	130 264 96	134 212 17	59 168 14	5 916 81
Insurance	28 986 27	22 797 62	26 204 54	33 505 17	30 935 06	6 047 04	604 70
Fuel and lights	163 872 94	173 354 09	193 468 50	207 715 55	274 079 19	144 103 01	14 410 30
Other incidentals	44 238 72	44 911 73	65 724 42	69 471 62	63 942 08	32 891 79	3 289 18
All other purposes	620 861 78	1 094 825 31	868 599 10	1 179 282 78	1 009 489 07	602 449 63	60 244 96
Total	\$5 226 824 83	\$6 096 374 41	\$5 702 717 52	\$6 027 708 66	\$7 106 999 90	\$4 266 717 78	\$426 671 78

b Included under "all other purposes." *c* Not reported.

10 SECONDARY SCHOOLS CLASSIFIED BY GRADES 1897-1903, WITH NUMBER OF STUDENTS IN EACH, GROWTH AND AVERAGE ANNUAL INCREASE (concluded)

D CREDENTIALS 1903

Preliminary certificates	19 217
1st year "	10 069
2d " "	7 487
3d " "	5 852
4th " "	59
Advanced certificates.....	26
Diplomas	4 308
Advanced diplomas	2 261

E SUMMARY OF ACADEMIC EXAMINATIONS 1893-1903

Including law and medical statistics

	1893	1894	1895	1896	1897	1898
Schools taking examinations.	393	417	467	517	557	608
Papers written.....	310 538	371 876	405 557	419 802	445 285	470 471
Papers claimed.....	193 744	252 287	276 544	279 641	292 600	326 995
Papers allowed.....	170 641	220 863	242 689	238 656	252 745	286 426
Papers rejected.....	23 103	31 424	33 855	40 985	39 855	40 569
Per cent of claimed papers allowed.....	88	88	88	85	86	88
Per cent of papers claimed to total number written.....	62	68	68	67	66	70
Per cent of papers allowed to total number written.....	55	59	60	57	57	61
Per cent of honor papers to total number accepted.....	20	20	21	20	19	21

E SUMMARY OF ACADEMIC EXAMINATIONS 1893-1903 (concluded)

Including law and medical statistics

	1899	1900	1901	1902	1903
Schools taking examinations....	639	672	699	726	730
Papers written.....	508 841	543 765	538 833	558 801	539 241
Papers claimed.....	361 329	407 187	411 039	438 047	418 230
Papers allowed.....	312 652	365 007	353 939	382 855	358 015
Papers rejected.....	48 677	42 180	57 100	55 192	60 215
Per cent of claimed papers allowed.....	87	90	86	87	86
Per cent of papers claimed to total number written.....	71	75	76	78	78
Per cent of papers allowed to total number written.....	61	67	66	69	66
Per cent of honor papers to total number accepted.....	21	23	21	23	22

F CRITICISM OF QUESTION PAPERS 1892-1903

	Satisfactory	Too long	Too short	Too difficult	Too easy	
1893	87 %	2.6%	.1%	9.1%	1.2%	100%
1894	91.2	2.8	.1	5.5	.9	100
1895	92.2	1.6	.....	5.6	.6	100
1896	91.2	1.5	.....	6.9	.4	100
1897	88.1	4	.....	7.4	.5	100
1898	92.9	1.4	.....	5.5	.2	100
1899	92.5	1.4	.....	5.7	.4	100
1900	94.7	1	.....	3.9	.3	100
1901	98.9	1.4	.....	4.6	.1	100
1902	95.1	1	.1	3.6	.2	100
1903	95.3	1	.....	3.7	.2	100

G CALENDAR OF ACADEMIC EXAMINATIONS 1903

DATES	Place	Subjects
1903		
Jan. 26-30.....	728 secondary schools.....	82
Mar. 25-27.....	702 ".....	30
June 15-19.....	731 ".....	84

H SUMMARY OF INSPECTIONS 1903

INSPECTOR	High schools	Academies	Colleges	Professional and special schools	Universities	Registered private schools	Special corporations	Business schools	Miscellaneous schools not in University	Libraries and museums	Total
C. F. Wheelock.....	6	1	...	4	1	...	...	...	...	...	13
C. N. Cobb.....	43	22	...	3	...	3	9	...	16	...	96
A. G. Clement.....	109	20	...	3	...	...	1	...	2	...	135
Charles Davidson.....	102	13	...	...	...	2	...	...	1	...	118
E. W. Lyttle.....	124	10	1	5	1	...	1	...	4	...	146
S. D. Arms.....	138	39	2	...	...	...	2	...	3	...	184
E. J. Peck.....	133	9	2	1	1	...	...	...	...	...	146
E. S. Frisbee.....	69	36	1	...	...	...	...	...	...	...	106
W. R. Eastman.....	...	...	...	...	...	...	...	...	...	74	74
W. F. Yust.....	...	...	...	...	...	...	...	...	...	256	256
I. O. Crissy.....	17	5	...	...	...	...	37	...	...	...	59
J. H. Gibson.....	115	1	...	...	...	...	...	...	1	...	117
F. M. Baker.....	150	5	...	...	...	...	...	...	...	...	155
Other members of staff.	20	1	...	...	...	...	...	...	...	...	21
	1 026	162	6	16	3	5	13	37	27	a330	1 625
Library inspections.....											330
Other ".....											1 295

a Including 19 not in University.

Educational meetings. In addition to these visits to institutions, the inspectors have attended and taken part in the exercises of educational meetings as follows:

1902**Charles F. Wheelock**

- Oct. 15 Albany, Council of Superintendents
- Oct. 16 Albany, School Boards Association
- Nov. 1 Canajoharie, county association
- Nov. 10 Ithaca, high school
- Nov. 15 Fonda, Tricounty Council
- Dec. 29-31 Syracuse, Associated Academic Principals

1903

- Jan. 23 Union, dedication of school building
- Feb. 14 Rockland Co. Teachers Association
- Feb. 21 Watertown, Principals Council
- Mar. 13 Plattsburg, Champlain Valley Educational Council
- Mar. 20 Jamestown, county association
- Ap. 3 Cornwall, address
- May 14 Schenectady, high school, address
- May 22-23 Avon, county association
- June 24 Waverly, commencement
- June 25 Middlebury, commencement
- June 26 Canajoharie, commencement
- July 6-11 Boston Mass., National Educational Association

1902**Charles Newell Cobb**

- July 2-3 Saratoga, State Teachers Association
- Oct. 15-17 Albany, Council of City and Village Superintendents
- Oct. 15-17 Albany, School Boards Association
- Oct. 18 Caldwell, Warren Co. Teachers Association
- Nov. 7-8 Albany, Hudson River Schoolmasters Club
- Nov. 15 Fonda, Tricounty Council
- Nov. 28-29 Baltimore Md., Association of Colleges and Preparatory Schools of the Middle States and Maryland
- Dec. 20 New York, Educational Council
- Dec. 30-31 Syracuse, Associated Academic Principals
- Dec. 30-31 Syracuse, New York State Science Teachers Association

1902

Dec. 30-31 Syracuse, Grammar School Principals Association

1903

Jan. 27-28 Albany, School Commissioners Association

Mar. 25 New York, meeting of presidents of New York colleges for men to consider Rhodes scholarships

Ap. 17-18 Albany, Hudson River Schoolmasters Club

1902

A. G. Clement

Oct. 18 Goshen, Orange Co. Teachers Association

Dec. 30 Syracuse, New York State Science Teachers Association

1903

May 15 Hartwick, Otsego Co. Teachers Association

June 19 Troy, La Salle Institute, commencement

June 22 Margaretville, commencement

June 24 Cornwall, commencement

June 26 Milford, commencement

July 8 Boston Mass., National Educational Association

1902

Charles Davidson

Oct. 10 Oswego, normal school, address

Dec. 8-12 Elmira, three teachers conferences

1903

Ap. 10 Utica, Round Table Conference

May 9 Pulaski, Teachers Association

May 16 Williamson, Ontario Co. Teachers Association

May 22 Syracuse, Schoolmasters Club

May 23 Gouverneur, St Lawrence Teachers Association

June 26 Troy, St Joseph's Academy, commencement

1902

Eugene W. Lyttle

Aug. 17 Cliff Haven, Catholic Summer School

Sep. 4 New Hartford, dedication of high school

Oct. 25 Philadelphia, Jefferson Co. Teachers Association

Nov. 1 Canajoharie, Montgomery Co. Teachers Association

Nov. 14 New York, History Club

Nov. 28-29 Baltimore Md., Association of Colleges and Preparatory Schools of the Middle States and Maryland

Dec. 29-30 Syracuse, Associated Academic Principals

1903

Jan.	1-2	Philadelphia Pa., American Historical Association
Jan.	8	Sodus, dedication of high school
Jan.	23	Johnstown, teachers and parents meeting
Mar.	14	New York, Association of History Teachers of the Middle States and Maryland
Mar.	21	New York, reception Cliff Haven Summer School
Ap.	13	Albany, Hudson River Schoolmasters Club
Ap.	24	New York, City History Club
May	16	Chatham, Columbia Co. Teachers Association
May	30	Corinth, Memorial day exercises
June	21	Albany, Unitarian Church
June	22	Wilson, commencement
June	23	Angola, commencement
June	24-25	Clinton, Hamilton College, commencement
July	1-3	Plattsburg, State Teachers Association
July	6-10	Boston Mass., National Educational Association

1902

S. Dwight Arms

Oct.	16-17	Albany, New York State Council of School Superin- tendents
Dec.	29-31	Syracuse, Associated Academic Principals

1903

Jan.	17	Rochester, Associated Academic Principals of Mon- roe and Orleans Counties
Jan.	28	Albany, State Association of School Commissioners
Feb.	11	Delevan, district meeting
Mar.	21	Rochester, Monroe and Orleans Co. Principals Asso- ciation
Mar.	27	Ashville, district meeting
May	9	Olean, Educational Council
May	22	Dunkirk, Chautauqua Co. Teachers Association
June	19	Limestone, commencement
June	22	Manchester, commencement
June	23	Florida, S. S. Seward Institute, commencement
June	24	Goshen, commencement
July	1-3	Plattsburg, State Teachers Association
July	6-10	Boston Mass., National Educational Association

1902

Ezra J. Peck

- Nov. 15 Penn Yan, Interlake Council
 Nov. 20-21 Canandaigua, Ontario Co. Teachers Association

1903

- Feb. 14 Watkins, Interlake Council
 May 9 Penn Yan, Interlake Council
 May 30 Windsor, Memorial day exercises
 June 22 Honeoye, commencement

1902

E. S. Frisbee

- Oct. 25 Catskill, Hudson River Teachers Association
 Dec. 29-31 Syracuse, Associated Academic Principals

1903

- July 1-3 Cliff Haven, State Teachers Association

1902

I. O. Crissy

- Sep. 14 Elmira, Education day address, North Church
 Oct. 15 Albany, State Association of School Boards
 Oct. 16 Albany, Council of Superintendents
 Nov. 3 New York, New York State Business School Association
 Dec. 30-31 Syracuse, Association of Academic Principals

1903

- Jan. 16 Buffalo, address on business education
 Feb. 6 New York, New York Commercial Teachers Association, address
 June 22 Watervliet, academy, address and presentation of diplomas
 July 1-3 Cliff Haven, State Teachers Association
 July 6-10 Boston Mass., National Educational Association

I NAMES CHANGED IN 1902-3

From	To	Date
Champlain Institute (Port Henry).....	Champlain Academy	Dec. 4, 1902
Charbonneau Institute (Rouse Point).....	St Patrick's Academic School of Rouse Point.....	May 21, 1903

3 TEACHING INSTITUTIONS

Summary of charters and admissions 1902-3

NAME	Postoffice	County	Date	Grade	Inspector	VALUE OF							Net property	
						Grounds	Buildings	Furni- ture	Library	Appa- ratus	Mu- seum	Other prop- erty		Debts
Permanent charters														
Augustinian Academy	Tompkinsville	Richmond	21 My 03	acad.	C	?	1,870 000	\$300	7,500	\$349 25			\$36 149 25	
Christian Brothers Academic School of Syracuse	Syracuse	Onondaga	21 My 03	j. a.	A	?	614 200	1 200	274 80	104		\$200	9 038 80	
St Lucy's Academic School	Syracuse	Onondaga	29 Je 03	j. a.	A	\$8 000	41 000	2 500	217 30	658			52 255 30	
St Patrick's Academic School of Cohoes	Cohoes	Albany	4 D 02	j. a.	F	1 000	6 000	500	205	118 50			77 823 50	
High schools and academic departments admitted														
Bombay Union School	Bombay	Franklin	21 My 03	j.	L	500	4 000	50	200	102			4 912	
Callicoon Depot Union School	Callicoon Depot	Sullivan	21 My 03	j.	C	1 200	2 100	400	200	100			4 000	
Cayuga Union School	Cayuga	Cayuga	4 D 02	j.	C	1 000	4 000	375	215	104			5 694	
Delaware Academy and Union School	Delhi	Delaware	4 D 02	h. s.	F	?	630 000	100	1 000	750	\$50		731 900	
Delaware Literary Institute and Union School	Franklin	Delaware	4 D 02	h. s.	C	2 500	12 500	500	500	250			716 250	
Elbridge Union School and Academy	Elbridge	Onondaga	4 D 02	s.	A	1 800	21 000	350	550	542	160	11 000	735 982	
Knoxboro Union School	Knoxboro	Oneida	29 Je 03	j.	L	300	900	220	208	134			1 762	
New York Normal College of the City of New York, high sch. dept.	New York	New York	21 My 03	h. s.	C	333 333 33	106 666 66	25 000	5 000	8 500	406 66		533 986 65	
Orwell Union School	Orwell	Oswego	4 D 02	j.	D	500	2 000	100	200	110			2 910	
Philmont Union School	Philmont	Columbia	4 D 02	j.	F	1 000	10 000	700	710 75	130 25			11 634	
Randolph Union School	Randolph	Cattaraugus	29 Je 03	j.	A	1 500	8 750	650	280 45	131 50			11 811 95	
Scottsville Union School	Scottsville	Monroe	4 D 02	s.	A	2 000	15 000	400	600	888			18 388	
Scottsville Union School	Scottsville	Monroe	4 D 02	s.	A	2 000	15 000	400	600	888			18 388	
Tuxedo Union School	Tuxedo Park	Orange	4 D 02	j.	C	5 000	23 000	850	1130 66	100			29 040 66	
Unadilla Forks Union School	Unadilla Forks	Otsego	29 Je 03	j.	L	200	1 800	240	294	110			2 594	
West Carthage Union School	West Carthage	Jefferson	21 My 03	j.	L	500	1 000	321	200	100			2 121	
Woodmere Union School	Woodmere	Nassau	29 Je 03	j.	L	4 500	15 000	2 300	223 05	225 46			22 148 51	
Total						\$364 853 33	\$418 916 66	\$36 916	\$11 132 01	\$7 946 96	\$996 66	\$11 210	\$42 000	\$830 631 62
Average						21 400 78	22 445 83	1 645 80	557 80	387 35	222 22	5 600	21 000	41 641 58

a A = 8, Dwight Arms; C = Charles N. Cobb; Cl = Arthur G. Clement; D = Charles Davidson; F = Eugene W. Lyttle. b Includes grounds.
 c Including piano. d Public library completes requirement. e Including musical instruments. f Leased.
 g 4 D 02. Academic department of Savannah Union School continued on list of University institutions, the defect in the organization of the union school hav-
 ing been corrected. h Leased. i Leased. j Leased. k Leased. l Leased. m Leased. n Leased. o Leased. p Leased. q Leased. r Leased. s Leased. t Leased. u Leased. v Leased. w Leased. x Leased. y Leased. z Leased.
 The contract between Union Free School District No. 10 of Franklin and Munro Collegiate Institute to the board of education of Union Free
 School District No. 9 of Elbridge. Contracts approved. 4 D 02. The contract between Union Free School District No. 10 of Cassenovia and Cassenovia Seminary
 under laws of 1892, ch. 265.

X PRELIMINARY AND ACADEMIC STUDIES TABLE

SUBJECTS	Total no. of schools reporting	SUMMARY OF CRITICISMS FOR 1903									
		SATISFACTORY		TOO LONG		TOO SHORT		TOO HARD		TOO EASY	
		Total	Per cent	Total	Per cent	Total	Per cent	Total	Per cent	Total	Per cent
1 Reading.....											
2 Writing.....											
3 Spelling.....	1 589	1 490	98.8					70	4.4	29	1.8
4 English, elementary.....	1 512	1 393	92.1	8	.5			110	7.3	3	.2
5 Arithmetic.....	1 621	1 573	97	5	.3			40	2.5	4	.2
6 Geography.....	1 603	1 557	97.1	2	.1	1	.1	40	2.5	4	.2
7 English, 1st year.....	437	374	85.6	30	6.9			42	9.6		
8 English, 2d year.....	359	325	90.5	25	7			11	3.1		
9 English, 3d year.....	148	141	95.3	4	2.7			3	2		
10 English, advanced.....	1 209	1 136	94	11	.9			65	5.4	1	.1
11 Word analysis.....	102	102	100								
12 English composition.....	1 120	1 104	98.6	3	.3			13	1.2		
13 Rhetoric.....	893	859	96.2	16	1.8			22	2.5		
14 American selections.....	416	406	97.6	3	.7			7	1.7		
15 English comp., advanced..	370	357	96.5	6	1.6			8	2.2		
16 English selections.....	220	211	95.9					9	4.1		
17 English reading.....	339	327	96.5	4	1.2			9	2.7		
18 History of literature.....	262	235	89.7	2	.8			25	9.5		
19 Business English.....	190	182	95.8	7	3.7			2	1.1		
20 German, 1st year.....	844	813	96.3	1	.1			30	3.6		
21 German, 2d year.....	508	447	88	1	.2			61	12		
22 German, 3d year.....	168	159	94.6					9	5.4		
23 French, 1st year.....	327	320	97.9					6	1.8	1	.3
24 French, 2d year.....	267	258	96.6					9	3.4		
25 French, 3d year.....	161	159	98.8					2	1.2		
26 Spanish, 1st year.....	45	45	100								
27 Spanish, 2d year.....	42	42	100								
28 Spanish, 3d year.....	41	41	100								
29 Latin, 1st year.....	1 156	1 147	99.2					9	.8		
30 Latin, 2d year.....	147	147	100								
31 Caesar's Commentaries...	936	917	98	2	.2	1	.1	17	1.8		
32 Latin, 3d year.....	89	89	100								
33 Sallust's Catiline.....	146	144	98.6					2	1.4		
34 Cicero's Orations.....	508	500	98.4					7	1.4	1	.2
35 Virgil's Aeneid.....	403	401	99.5					2	.5		
36 Virgil's Eclogues.....	83	83	100								
37 Latin composition.....	309	308	99.7					1	.3		
38 Greek, 1st year.....	156	149	95.5					7	4.5		
39 Greek, 2d year.....	48	47	97.9					1	2.1		
40 Xenophon's Anabasis.....	185	183	98.9	1	.5			1	.5		

K PRELIMINARY AND ACADEMIC STUDIES TABLE (concluded)

SUBJECTS	Total no. of schools reporting	SUMMARY OF CRITICISMS FOR 1903									
		SATISFACTORY		TOO LONG		TOO SHORT		TOO HARD		TOO EASY	
		Total	Per cent	Total	Per cent	Total	Per cent	Total	Per cent	Total	Per cent
41 Homer's Iliad	101	101	100								
42 Greek, 3d year	34	34	100								
43 Greek composition	81	81	100								
44 Arithmetic, advanced	354	279	78.8	5	1.4			72	20.3		
45 Algebra	1 315 1	211	92.1	10	.8	3	.2	89	6.8	4	.3
46 Algebra, advanced	193	146	75.6	6	3.1			46	23.8		
47 Plane geometry	1 174 1	100	93.7	29	2.5			53	4.5	1	.1
48 Solid geometry	322	278	86.3	12	3.7	1	.3	34	10.6		
49 Trigonometry	145	119	82.1	23	15.9			7	4.8		
50 Business arithmetic	287	245	85.4	35	12.2			11	3.8	2	.7
51 Astronomy	146	142	97.3					4	2.7		
52 Physics	784	747	95.3	2	.3			36	4.6		
53 Chemistry	292	284	97.3					8	2.7		
54 Physical geography	1 127 1	060	94.1	1	.1			66	5.9	1	.1
55 Geology	332	323	97.3					9	2.7		
56 Botany	313	310	99					3	1		
57 Zoology	156	146	93.6					10	6.4		
58 Physiology and hygiene	1 319 1	281	97.1			1	.1	31	2.4	6	.5
59 Elem. U. S. hist. and civics	1 435 1	387	96.7	3	.2			42	2.9	3	.2
60 Greek history	446	438	98.2	1	.2			6	1.3	1	.2
61 Roman history	490	483	96.8	3	.6			12	2.4	2	.4
62 Medieval history	185	181	97.8	3	1.6			2	1.1		
63 English history	626	587	93.8	5	.8			36	5.8		
64 U. S. history, advanced	431	419	97.2	1	.2			8	1.9	3	.7
65 Civics	1 141 1	110	97.3			1	.1	30	2.6		
66 Economics	624	617	98.9					5	.8	2	.3
67 Commercial geography	263	258	98.1					5	1.9		
68 Commercial law	94	93	98.9					1	1.1		
69 History of commerce	72	71	98.6					1	1.4		
70 Stenography, 50 word test	116	115	99.1	1	.9						
71 Stenography, 100 word test	87	84	96.6	1	1.1	1	1.1	1	1.1		
72 Bookkeeping	710	637	89.7	41	5.8	1	.1	39	5.5	1	.1
73 Bookkeeping, advanced	101	87	86.1	14	13.9						
74 Business practice, etc.	81	80	98.8	1	1.2						
75 Business writing	245	241	98.4	3	1.2					1	.4
76 Typewriting	100	106	97.2					3	2.8		
77 Drawing	1 184 1	110	97.9	4	.4			18	1.6	2	.2
78 Advanced drawing	598	554	92.6	13	2.2			30	5	1	.2
79 Psychology	109	108	99.1					1	.9		
80 Ethics	54	54	100								

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University of the State of New York

High School Department PUBLICATIONS

Gaps in the series indicate that the numbers omitted are replaced by later editions or are for other reasons out of print.

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Syllabus of Form Study and Drawing. 30p. 32pl. 25c.

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High School Department reports 1898-date. O. 75c a vol. cloth.

High School Department bulletins 1898-date. *To advance subscribers 50c a year.*

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X19 (High School 3) Associated Academic Principals. *Proceedings of the 14th Annual Conference*, Dec. 1898. 236p. Dec. 1899. 25c.

University of the State of New York

- X20** (High School 4) Academic Examination Papers 1899. 306p. Oct. 1899. 25c. *Small size 12.5 x 20 cm, 25c; boards, 50c.*
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- X38** (High School 22) Academic Examination Papers 1903. 308p. July 1903. 25c.
- X39** (High School 23) Director's Report 1903. 52p. 1904. 15c.
- Question papers.** For the academic year 1892 (v. 1); 1893 (v. 2); 1894 (v. 3); 1895 (v. 4). D. 25c; boards, 50c.

For 1896-1902 see X10, X14, X16, X20, X26, X30, X34, X38. Till 1898 each volume contained all the Regents question papers of that year in any of the academic, professional law, medical, dental, veterinary, library and extension examinations. After the first edition of the 1898 examination papers the academic and professional papers were separated.

New York State Museum

EPHRAIM PORTER FELT State Entomologist

Bulletin 76

ENTOMOLOGY 21

19th Report of the State Entomologist

ON

INJURIOUS AND OTHER INSECTS

OF THE

STATE OF NEW YORK

1903

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ALBANY

UNIVERSITY OF THE STATE OF NEW YORK

1904

University of the State of New York

REGENTS 1903

With years of election

1892	WILLIAM CROSWELL DOANE	D.D. LL.D.	<i>Chancellor</i>	Albany
1878	WITELAW REID	M.A. LL.D.	<i>Vice Chancellor</i>	New York
1877	CHAUNCEY M. DEPEW	LL.D.	- - - -	New York
1877	CHARLES E. FITCH	LL.B. M.A. LL.D.	-	Rochester
1881	WILLIAM H. WATSON	M.A. M.D. LL.D.	- -	Utica
1881	HENRY E. TURNER	LL.D.	- - - -	Lowville
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1885	DANIEL BEACH	Ph.D. LL.D.	- - - -	Watkins
1890	PLINY T. SEXTON	LL.D.	- - - -	Palmyra
1890	T. GUILFORD SMITH	M.A. C.E. LL.D.	- -	Buffalo
1893	LEWIS A. STIMSON	B.A. LL.D. M.D.	- - -	New York
1895	ALBERT VANDER VEER	M.A. Ph.D. M.D.	-	Albany
1895	CHARLES R. SKINNER	M.A. LL.D.		

Superintendent of Public Instruction, ex officio

1897	CHESTER S. LORD	M.A. LL.D.	- - - -	Brooklyn
1900	THOMAS A. HENDRICK	M.A. LL.D.	- - -	Rochester
1901	BENJAMIN B. ODELL JR	LL.D.	Governor, ex officio	
1901	ROBERT C. PRUYN	M.A.	- - - -	Albany
1902	WILLIAM NOTTINGHAM	M.A. Ph.D. LL.D.	-	Syracuse
1903	FRANK W. HIGGINS	Lieutenant Governor, ex officio		
1903	JOHN F. O'BRIEN	Secretary of State, ex officio		
1903	CHARLES A. GARDINER	LL.B. M.A. Ph.D. LL.D.		New York
1903	CHARLES S. FRANCIS	B.S.	- - - -	Troy

One vacancy

SECRETARY

Elected by Regents

1900 JAMES RUSSELL PARSONS JR M.A. LL.D.

DIRECTORS OF DEPARTMENTS

1888	MELVIL DEWEY	M.A. LL.D.	<i>State Library and Home Education</i>
1890	JAMES RUSSELL PARSONS JR	M.A. LL.D.	<i>Administrative, College and High School Depts</i>
1890	FREDERICK J. H. MERRILL	Ph.D.	<i>State Museum</i>

New York State Museum

FREDERICK J. H. MERRILL Director
EPHRAIM PORTER FELT State Entomologist

Bulletin 76

ENTOMOLOGY 21

19th REPORT OF THE STATE ENTOMOLOGIST 1903

To the Regents of the University of the State of New York

I have the honor of presenting herewith my report on the injurious and other insects in the State of New York for the year ending Oct. 15, 1903.

General entomologic features. The season of 1903 will long be known on account of the abnormal abundance of plant lice of various species, which have not only been exceedingly destructive to fruit trees in particular but the prolongation of their depredations far beyond the usual date was specially injurious to young or recently set trees. The latter part of the summer the San José scale, *Aspidiotus perniciosus* Comst., bred so excessively that many trees were literally covered with half grown scale insects toward the end of the season. The depredations of the elm leaf beetle, *Galerucella luteola* Müll., have continued in the Hudson river valley though the spraying operations of recent years have reduced their numbers very largely in Albany and Troy. An interesting feature of this insect's history was its presence in excessive numbers at Saratoga Springs, where it would undoubtedly have caused severe injury had it not been for the prompt spraying instituted by the village authorities. The white marked tussock moth, *Notolophus leucostigma* Abb. & Sm., has caused less damage than usual in recent years

though it was generally present at Buffalo on a great many horse-chestnut trees, partially defoliating thousands. The fall web-worm, *Hyphantria textor* Harr., has, as a rule, been less injurious than in preceding years, except in a few localities.

Office work. The general office work has been conducted as in preceding years and has been marked by many more demands for information, indicating an increased interest. The determinations of scale insects for the commissioner of agriculture, in connection with the nursery inspection work of his department, has made somewhat extensive demands on the time of Assistant C. M. Walker, who has also had charge of most of the breeding cage work. Many photographs of living insects or specimens of their work have been taken and a number of lantern slides added to the collection, greatly increasing its effectiveness in illustrating popular lectures. It is gratifying to record that there have been no changes in the office staff during the past year, and consequently the work has proceeded without interruption from this cause. Correspondence indicates a continued and healthy interest in our work, as is evidenced by the following figures: 2035 letters, 784 postals, 490 circular letters and 1109 packages were sent through the mail during the past year. The reduction from last year in the number of postals and packages is due to the fact that but three publications were issued during the present year against four in 1903, and the last issued was not available for distribution till very late, consequently a portion of the copies will be sent out next year. Mailing expenses have also been reduced by sending two or more publications by express, wherever that was economical, a total of 114 packages being shipped.

Special investigations. The lines of work begun in earlier years have been continued and considerable progress made. The grape-vine root worm, *Fidia viticida* Walsh, has been the subject of more extended investigations than last year, a large amount of exceedingly valuable data has been secured and we have demonstrated that collecting the beetles was a practical, the most reliable and probably the most economical method of controlling this pest. The details of this work will appear in a revised and *extended bulletin* on this insect. The experiments with insecti-

cides for controlling the San José scale have been carried on in the same orchard as in the past three years, and our earlier results with crude petroleum have been confirmed. Extended experiments with lime-sulfur washes have also been conducted at Warwick with very gratifying results. An extensive series of experiments with summer washes was made, Mr Walker having direct charge of the work and being responsible for most of the observations. A second instalment of the beneficial Chinese ladybeetle, *Chilocorus similis* Rossi, which may prove of value in suppressing this pernicious scale insect, was obtained from the United States Department of Agriculture last August and established in an infested orchard at Kinderhook. It is hoped that they will survive in this latitude and prove of great value in controlling this dangerous pest. The extended forest fires in the Adirondacks early in the season offered an excellent opportunity for investigating the connection between them and insect attack. The results of this work are given on a subsequent page. Our general studies of forest and shade tree insects have been continued and a number of valuable observations made.

The present year has been marked by the appearance of a second report by Dr Needham on aquatic insects, which consists of a series of valuable original articles by himself, supplemented by important papers from Messrs MacGillivray, Johannsen and Davis. Another report by Dr Needham, is now in preparation and will be devoted largely to a consideration of the May flies and midges (*Chironomidae*) of the State.

Investigations on our native mosquitos have been continued, resulting in material additions to our knowledge. Collections of these little insects have been made in different sections of the State, and it was possible for Assistant D. B. Young to spend two weeks at Long Island, working in cooperation with the North Shore Improvement Association, which has become well and favorably known to all interested in this line of effort on account of its very efficient operations in subduing these pests in the vicinity of New York city.

Publications. The principal publications of the entomologist, to the number of 70 are listed under the usual head. The more

important of those issued during the past year are the following: *Grapevine Root Worm* (Museum bulletin 59), *18th Report of the State Entomologist 1902* (Museum bulletin 64) and *Aquatic Insects in New York State* (Museum bulletin 68). In addition, the entomologist has contributed an important paper on insects injurious to pine and oaks, for the seventh report of the Forest, Fish and Game Commission, and one on insecticides for the report of the Colorado State Board of Horticulture for 1902.

Other important publications, which are either in the printer's hands or practically completed, are as follows: *Grapevine Root Worm*, a revised and extended edition of Museum bulletin 59, mentioned above. A monograph of the genus *Saperda*, which includes some of our most destructive borers, has been prepared by the entomologist in association with Mr L. H. Joutel of New York city, and will form a small bulletin of about 80 pages illustrated by 7 colored plates. Dr Needham's third report, mentioned in the preceding paragraph, is practically completed and will be an extended work about the same size as Museum bulletin 68. There is also a memoir on insects injurious to forest and shade trees, an extensive publication illustrated with many halftones and 16 colored plates, treating specially of those forms which are destructive to shade trees.

Collections of insects. Very large additions have been made to the state collections during the past season. They are specially desirable because a considerable proportion have come from other sections of the State. Mr Young spent several weeks in the Adirondacks in special work on forest insects, and he has collected at intervals throughout the season in cooperation with the Vassar Brothers Institute, at Poughkeepsie, and also at Long Island while engaged on mosquito investigations. The results have been large and exceedingly valuable additions to the state collections. Much progress has been made in arranging insects previously collected. The Lepidoptera, which are in the care of Mr Walker, have all been referred to the principal groups and many determined specifically. He has also arranged the Coccidae, now represented by 98 species and a host of specimens, while Mr Young *has been able to do considerable systematic work on the Tenthre-*

dinidae, Ichneumonidae, Syrphidae, Tachinidae and Capsidae, besides making material progress in arranging the Coleoptera which, it is gratifying to state, are already in a fairly satisfactory condition. The exhibit collection has received valuable additions from time to time, and in all of our collecting an effort has been made to secure material desirable for this purpose. The museum was kindly remembered during the present year and bequeathed a small collection of insects by Miss Ellen L. Baker of Middle Granville N. Y.

The past season a system of exchange was inaugurated with most excellent results. The museum possesses large series of certain species. Lists were prepared and sent to entomologists in different sections of this and other countries with a request for exchanges, and as a result some exceedingly valuable additions have been made to the collection with practically no cost to the museum. The details of these exchanges together with a list of species available for this purpose will be found under a separate head.

Nursery inspection work. Owing to the Virginia authorities refusing in the fall of 1902 to accept nursery inspection certificates issued by the State Department of Agriculture, even though officially indorsed by us, other means had to be devised to aid those who wished to ship nursery stock into Virginia. The state entomologist of Virginia was willing to accept a certificate based on inspection by an assistant working under our direction, and as an accommodation to our nurserymen, it was arranged to send an assistant to make supplementary inspections of only that stock which was destined for Virginia, the parties benefited to pay his traveling expenses. Mr C. M. Walker was detailed for this work, which occupied nearly two weeks. It is very gratifying to state that the regular inspectors, in whom we have utmost confidence, kindly aided Mr Walker in his work. Mr H. C. Peck and Mr J. J. Barden, in whose territory most of the inspecting was done, were specially helpful. The following is a list of firms to whom these nursery certificates were issued between Oct. 21 and Nov. 1, respectively: Mt Hope Nurseries, Western New York Nursery Co., Thomas Bowman & Son, A. L. Wood, Allen Nursery Co., H. S. Taylor & Co., Charlton Nursery Co., all of Rochester; Sheeren

Wholesale Nurseries, George A. Sweet Nursery Co., Rogers Nursery, all of Dansville; Brown Bros. Co., Chase Bros. Co., First National Nurseries, Perry Nursery Co., J. B. Nellis & Co., all of Brighton; Lewis Roesch, T. S. Hubbard Co., G. S. Josselyn Co., all of Fredonia; Knight & Bostwick, Emmons & Co., and C. W. Stuart & Co., all of Newark.

Voluntary observers. The work of the voluntary observers begun in 1899 has been continued, but owing to an unusually dry spell in the early part of the season followed by excessive rains, there has been comparatively little to report except injuries by plant lice, a group of insects on which the voluntary observers are not well qualified to report. As a consequence, there are not so many records as have been made in earlier seasons, though the sum total of their observations amounts to a material addition to our knowledge concerning some very important injurious insects. Summaries of these reports are published under the usual head.

Acknowledgments. The untimely death of our highly esteemed and gifted associate, the late Prof. V. H. Lowe of the State Agricultural Experiment Station at Geneva, is a source of deep regret and a severe loss to the science he loved so well. The entomologist has been favored by the cooperation of a number of professional workers. To Dr L. O. Howard, chief of the division of entomology, United States Department of Agriculture, and his staff, special acknowledgments are due for the determination of a number of insects and for information regarding different species. Mr E. P. VanDuzee, of Buffalo, a well known authority on Hemiptera, has kindly identified all our Pentatomidae and a number of related forms, and we are indebted to Prof. Mel. T. Cook, of De Pauw University, Greencastle Ind., for the determination of many insect galls. The appreciation of our work by the many friends of the office is a source of pleasure, and the support given by those in authority is very gratifying.

Respectfully submitted

EPHRAIM PORTER FELT

State Entomologist

Office of the State Entomologist
Albany, Oct. 15, 1903

BENEFICIAL INSECTS

SYNOPSIS OF CERTAIN GENERA OF THE OPHIONINI

The following account of species belonging to various genera of this group is the result of a study, extending over some years, originally begun at Cornell University under the auspices of Prof. J. H. Comstock, to whom the writer is under deep obligations for assistance. The original assignment covered the species placed in this genus by Cresson, and owing to many other matters demanding attention, we have reluctantly decided to publish our results without attempting to extend our studies so as to include all the members of this group, particularly because of lack of time, and specially since a number of genera are represented only by foreign species. We also take this opportunity to express our obligations to Dr W. H. Ashmead, curator of the Hymenoptera, United States National Museum, who in recent years has kindly loaned us specimens and afforded material aid in our systematic study.

This group includes some of our larger and more common parasites, and to the species comprising it much credit is due for material aid in controlling a number of our insect pests. For example the long-tailed Ophion, *Eremotylus macrurus* Linn. is a common parasite of large cecropia larvae and allied species. These large caterpillars are rarely abundant enough to attract attention by their ravages, and one reason for this is undoubtedly the activity of their parasites, foremost of which stands the long-tailed Ophion.

Value as parasites

The other species of this group have been reared from a large number of hosts, and there is no reason for regarding several of them as of less value than *Eremotylus macrurus* Linn. The following statistics will give some idea of their abundance and, as the life of the host with its attendant possibilities is destroyed as each develops, they also give some idea of the economic value of the species. Six trap lanterns were in operation during the entire season of 1889 at Cornell University for the purpose of ascertaining the value of lights for destroying insects, and nearly

600 examples of ophonids were taken. Two species were well represented in this lot: There were none of the long-tailed Ophions, hence the figures give no idea of the relative abundance of this parasite or of the other species not represented. The one by far the most abundant was *O p h i o n b i l i n e a t u m* Say, the two-lined Ophon, which was represented by 450 examples. The species next in abundance was *O p h i o n t i t y r i* Pack., which was represented by 118 examples, while *E n i s c o p i l u s p u r g a t u s* Say was represented by but 23 individuals. It will be noticed that the two species taken most abundantly are not well represented in most collections and but little is known of their habits. This record does not in the least reflect on the value of these two as parasites. It is possible that both are equally efficient in their own fields and it is most probable, seeing that they are crepuscular or nocturnal in habit, that they breed largely in larvae which rarely fall into the hands of the collectors. The two-lined Ophon has been reared mostly from arctians or noctuids. Though records of this character are still far too scarce to permit the formation of a positive opinion, it is likely that this species does material service in keeping larvae belonging to these two families in check. The observations are even more meager regarding *O p h i o n t i t y r i*. Here is certainly a field for investigation.

General habits

The different members of this group may usually be seen flying slowly about shrubbery and in the grass during bright days from early May till into October. In cloudy and wet weather they seek some sheltered place—at least this is true of the diurnal species. The long-tailed and the purged Ophions are the two taken most commonly in the day, and they are the best represented in most collections examined. The trap lantern record would appear to indicate a great preponderance of the two-lined Ophon. This must be ascribed to the crepuscular or nocturnal habits of the latter form. The females are the more active and are more abundant in collections. This might be expected, as on her devolves the labor of searching out a suitable nidus for

her eggs. The large proportion of females is well shown in the trap lantern record, where but 87 males were taken to 485 females. The great activity of the females and the large number of them attracted to lights must diminish materially the value of the trap lantern as a means of destroying insect pests.

Oviposition and larval habits

The females possess a sharp ovipositor which is capable of inflicting a slight wound. Its sharpness appears to be mainly for defensive purposes, as the eggs are deposited usually on the skin of the host, to which they firmly adhere by means of a cement or glue extruded at the moment of oviposition. The deposit of the egg by *Eremotylus macrurus* has been graphically described by Trouvelet as follows¹: "When an Ichneumon detects the presence of a worm, she flies around it for a few seconds, and then rests upon the leaf near her victim; moving her antennae very rapidly above the body of the worm, but not touching it, and bending her abdomen under the breast, she seizes her ovipositor with the front legs, and waits for a favorable moment, when she quickly deposits a little oval white egg upon the skin of the larva. She is quiet for some time and then deposits another upon the larva, which only helplessly jerks its body every time an egg is laid." Eight to ten eggs are laid in this manner. A few days later they hatch and the larvae make their way under the skin of their victim, feeding on the fatty portions of the host at first, but later most of the tissues are devoured. The miserable victim of these parasites drags out a weary existence and usually perishes in the pupal state, rarely before. As a single larva will provide sustenance for the development of but one or two parasites, the weaker ones perish.

There is on the front tibia of *Ophion* an articulated, apical spine, a structure common to many Hymenoptera, which is possibly connected with the method of oviposition narrated above. This articulated spine is curved toward the tarsus near the apex, and might consequently be used for holding the ovipositor, be-

¹1868 Am. Nat. 1:89-91.

cause when apposed to the tarsus the bend is such as to allow the ovipositor to pass easily through a space between the two. It is worthy of note in this connection, as showing the method of depositing eggs by an insect belonging to the same family, that *Thalessa* has been seen ovipositing in a similar manner by reliable observers.¹

Pupation and final transformations

The larva of *Eremotylus macrurus* usually pupates within the cocoon of its victim. As this species preys largely on the saturnians, the larvae of which spin stout cocoons, the grub of the parasite on emerging from the remains of its victim finds itself in a well protected cocoon, and consequently has no need of looking for a more secure place in which to undergo its final transformations. The same habit is probably common to other species infesting hosts spinning a stout cocoon, as, for example, *Erem. arctiae* when preying on these moths. The cocoons of *Eniscopilus purgatus* are found in the soil or under shelter near where its host has transformed. From the lack of evidence to the contrary, it may be presumed that such is the general habit of all the species infesting larvae that do not spin stout cocoons before pupation.

Very few notes exist on the duration of the pupa state in this genus. Riley states that the imagos of *Erem. macrurus* commonly emerge in the spring, and rarely come forth in the autumn. This would apparently indicate that the normal habit of this insect is to pass the winter in the pupal stage. An example of *Enis. purgatus* has been known to pupate July 24, the imago emerging Sep. 13.

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Synopsis of genera treated

- a** Cubitodiscoidal nervure irregularly thickened, never appendiculate
b Yellowish chitinous spots in cubitodiscoidal cell....*Eniscopillus Curtis*
bb No such spots in cubitodiscoidal cell.....*Eremotylus Forster*
aa Cubitodiscoidal nervure never irregularly thickened, usually appendiculate
b Face normal.....*Ophion Gravenhorst*
bb Face elongated.....*Genophion Felt*

Synopsis of species of *Eremotylus*

- a** Cubitodiscoidal vein usually strongly sinuate; hooks of hind wings 13-15; male clasps rather long, subrectangular, obtusely rounded at the apex.....**macrurus** Linn.
- aa** Cubitodiscoidal vein nearly arcuate; first and second recurrent nerves nearly equal; hooks of hind wing 7-9; male clasps subrectangular, acutely rounded.....**arctiae** Ashm.
glabratus Say¹

Eremotylus macrurus Linn.

Long-tailed Ophion

This, the largest American species of the genus, is closely allied to *Erem. arctica* Ashm., which has been confused with it in collections. The two species are easily separated from the others of the genus by their considerably larger size; the smallest being perceptibly larger than the largest of the other species, excepting

¹See account of this species, p.106.

Ophiion fuliginipennis Felt, which belongs in a different group. *Erem. macrurus* may be separated from *Erem. arctiae* by its larger size, by the fulvous tinge of the wings and veins, by the second discoidal nervure being nearly twice the length of the first, and by there being from 13 to 15 hooks on the hind wings. Other differences are detailed in the description of *Erem. arctiae*.

Habits and life history. This species is an active, diurnal insect, being rarely if ever attracted to lights. It is the one most commonly bred from the large saturnians, and is frequently referred to as a parasite of one or more of them. Its egg-laying habits and life history, so far as known, have been described in a preceding paragraph. It has also been recorded as bred from some of the arctians, but it is probable that some of these records really pertain to *Erem. arctiae*. Dr C. M. Weed has recorded an instance in which 30 out of 50 pupae of *Samia columbia* Smith were parasitized by this insect. The unusual abundance of *Callosamia promethea* Dr. is recorded in *Insect Life*, 2:383, and also the interesting fact that fully two thirds of the pupae harbored this parasite. The observations of Dr Riley show that this insect usually emerges in the spring, though occasionally individuals come forth in the autumn.

This parasite has been reared from the following insects: *Isia isabella* Abb. & Sm., *Philosamia cynthia* Drury, *Callosamia promethea* Drury, *Samia columbia* Smith, *Samia cecropia* Linn., *Telia polyphemus* Cram., *Automeris io* Fabr. and *Apatelodes torrefacta* Abb. & Sm.

Description. Fulvo-ferruginous, stigma almost obsolete; marginal nervure sinuate, thickened toward the stigma; size large; body 31 to 38 mm long; wing spread 43 to 56 mm. Head small, antennae nearly as long as the body; ocelli prominent, black; head yellowish posteriorly; eyes black, rather small; mandibles bidentate, tipped with black. Mesothorax convex; scutellum and postscutellum prominent; anterior portion of metathorax depressed; posterior portion rugose, limited anteriorly by a transverse carina; lateral carinae present. Wings hyaline; marginal nervure thickened, sinuate near the small stigma; cubitodiscoidal nervure never appendiculate, usually strongly sinuate; third dis-

coidal cell considerably wider at apex than base; hooks on hind wings 13 to 15. Legs long, honey yellow. Abdomen long, strongly compressed, usually darker at tip. Male claspers rather long, subrectangular, obtusely rounded at apex.

Described from 10 examples.

Cocoon. The larva leaves the shriveled remains of its victim when full grown and pupates within the cocoon spun before the demise of its host. The cocoon is tough, oval, about 32 mm long and 17 mm broad, and occupies the larger portion of that spun by its prey. It is composed of silk agglutinated by a dark secretion. Exteriorly it is a dark brown color, with a faint yellowish or golden band around the center. The interior is thinly lined with a transparent substance and possesses a brilliant metallic luster.

Distribution. The recorded distribution of this insect is from New England to California and from Canada to Texas, indicating that the species ranges over practically the whole of the United States and north into Canada. It has been reported from the following localities: Canada, New England, New York, New Jersey, Pennsylvania, District of Columbia, Virginia, Louisiana, Illinois, Missouri, Nebraska, Colorado, Texas, Nevada and California.

Specimens have also been examined from the following localities: Ottawa, Canada [Harrington]; New York city [Joutel]; Dutchess county, N. Y. and Rock Creek park, Washington D. C. [U. S. Nat. Mus.] and from Malden and Amherst Mass. [Fernald].

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Eremotylus arctiae Ashm.

This species is by no means rare, though not recognized as a distinct form till 1890 owing to its having been confused with *Erem. macrurus*, which it closely resembles. A critical examination of the material in the state collection, Dr Lintner's private collection, and that from Cornell University, lent by Professor Comstock, has resulted in the finding of several examples of this species. Two specimens were taken in the trap lanterns at Cornell; one Aug. 3 and the other Aug. 22, 1889. Owing to the kindness of Messrs Howard and Ashmead, we have been permitted to examine a type of this species.

Hosts. This species is parasitic mostly on some of the arctians, though it has also been reared from saturnians. The following hosts are known: *Ecpantheria deflorata* Fabr., *Diacrisia virginica* Fabr., *Automeris io* Fabr. and *Callosamia promethea* Drury.

Description. The following is Mr Ashmead's description:

In *Erem. macrurus*, the wings have a decided fulvous tinge and the veins are fulvous; the second recurrent nervure is about twice as long as the first recurrent nervure, the third discoidal cell, therefore, is much wider at apex than at base; in *Erem. arctiae*, the wings are entirely without the fulvous tinge and the basal nervure, tips of median and discal nervures vary from brown to black, or piceo-black; the second recurrent nervure is only slightly longer than the first recurrent nervure, the cubital nervure being arcuate and the third discoidal cell, therefore, is about as wide at apex as at base; in *Erem. macrurus*, the transverse metathoracic carina is always more or less distinctly sinuated at the middle, in *Erem. arctiae* it is straight. In *Erem. arctiae* the hooks on the hind wings vary from seven to nine; in *Erem. macrurus* they are from 13 to 15; in the former the claws are pectinate; in the latter simple.

Male 26 mm long, wing expanse 35 mm; female 20 to 28 mm long, wing expanse 36 to 40 mm.

Figure 6 on plate 2 represents the wing characters of *Erem. macrurus*. In *Erem. arctiae* the cubitodiscoidal nervure is arcuate; in the type examined it was a nearly perfect arc, but in other specimens there was a slight tendency to the

sinuous course usually so marked in *Erem. macrurus*. The form of the third discoidal cell in the type was a little more regular than in our specimens and the first and second recurrent nervures were more nearly of an equal length. The wings of *Erem. arctiae* appear to be proportionately wider than in *Erem. macrurus*. In a study of examples of *Erem. macrurus*, I find the claws pectinate as well as in *Erem. arctiae*. The claspers of the male in the former species are rather long, subrectangular and obtusely rounded at tip, while in the latter they are subtriangular and acutely rounded at tip.

Distribution. This species is probably as widely distributed over this county as is *Erem. macrurus*. It is known to occur in New York, New Jersey, District of Columbia, Alabama, Mississippi and California, and specimens are before the writer from the following localities: Ottawa, Canada [Harrington]; Malden and Amherst Mass. [Fernald]; Michigan, Onaga Kan., Santa Cruz mountains and bred from *Halisidota agassizii* by Coquillett, Los Angeles Cal. [U. S. Nat. Mus.] There is a specimen from Pennsylvania and one from Texas in the Museum of Comparative Zoology, Cambridge Mass.

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Eremotylus glabratus Say

This species is apparently quite closely related to *Erem. arctiae* Ashm. and it is possible that this latter is a synonym of Say's species but that can be determined with certainty only by examining the type, which is apparently not in existence. A small example of *Erem. arctiae* corresponds very well indeed with the original description of this rare form. There is a cocoon in the Harris collection in the rooms of the Boston Society of Natural History, labeled "*Ophion glabratum*" but no

adult accompanies it though a specimen of *O. bilineatum* Say was in close proximity to the cocoon. There is apparently nothing in that collection which can be used in the identification of this species. A specimen in the United States national collection has been labeled by Dr Ashmead as *Eremotylus glabratus* Say. It corresponds very closely with the description of *Erem. arctiae*. The most apparent differences are in its small size and the comparatively slender marginal or radial nervure with no distinct angle or tooth near the stigma, a character which is usually well marked in both *Erem. macrurus* Linn. and *Erem. arctiae*.

This species has undoubtedly been erroneously identified in a number of collections and the following references, except that of its original describer, in all probability relate to something else. Prof. G. C. Davis some years ago informed me that but one individual of this species was known to be in existence and that was in his possession. Say's original description of this insect is reproduced below:

Honey yellow; a glabrous spot in the large cubital cellule.

Body dull honey yellow; head bright yellow; antennae, mouth and stemmata honey-yellow; eyes blackish; wings, first cubital cellule beyond its middle with a longitudinally oval glabrous space, but destitute of any opaque spot; metathorax transversely wrinkled near the petiole of the abdomen.

Length about $\frac{1}{2}$ inch.

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Table for separation of species of *Eniscopilus*

- a Larger chitinous spot in glabrous area of cubitodiscoidal cell, not appendiculate.....*purgatus* Say
 aa Larger chitinous spot in glabrous area of cubitodiscoidal cell, appendiculate

- b Chitinous process extending from larger chitinous spot along the posterior margin of the glabrous area and partly around its distal portion. Male clasps obtusely rounded.....*arcuatus* Felt
- bb Chitinous process from the larger spot not extending beyond the middle of the glabrous area. Smaller chitinous spot nearly circular and slightly posterior to the center of the glabrous area....
appendiculatus Felt

Eniscopilus purgatus Say

This species is easily recognized by the two opaque, chitinous spots in the cubitodiscoidal cell. The great tenuity and length of the basal two abdominal segments is very marked, and is frequently of service in identifying the insect, though this is also true of the much rarer *Enis. arcuatus* and *Enis. appendiculatus*. It is the species of this genus most frequently found in the East while collecting in the daytime and the one most common in collections.

Life history and habits. The imagos fly from the last of June till the last of September. They are diurnal and probably crepuscular in habit since they are attracted to lights to a certain extent, as is shown by the trap lantern experiments conducted at the Cornell University Agricultural Experiment Station in 1889.

Trap lantern records

	1889																		1892							
	JUNE				JULY								AUG.				SEP.				Total	JULY		AUG.		Total
	20	22	26	28	1	5	18	20	21	23	24	15	20	21	27	8	11	14	12	30	19					
Male	1	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	3	...	1	.....	1				
Female ..	1	1	2	1	...	1	1	2	2	...	1	1	1	2	1	1	1	1	20	1	....	2	3			

It will be seen by examining the record for 1889, that there are three distinct periods, separated by a space of about two weeks, in which this species was taken. Thus none were captured between July 5 and 18, July 24 and Aug. 15. These two non-productive periods may have been caused by climatic conditions, though it is hardly probable that unfavorable weather of any kind would prevent the species from flying by night for 13 consecutive days, to say nothing of the other period of three weeks. *It may be that this periodicity indicates three broods or at least*

periods when the imagos are more abundant, but in the absence of more data nothing but a surmise can be advanced.

The large number of females taken in the trap lantern reduces its value as a means of destroying noxious insects. Dr Packard observed that the bean-shaped egg of this insect was attached to the skin of the larval host by a pedicle, and that the newly hatched grub does not entirely leave the eggshell till it has eaten a hole into the side of its victim. It would therefore appear as though the sharpness of the ovipositor was largely for defensive purposes. The females can inflict a slight sting that will smart for half a minute or more, but the pain is by no means severe.

Hosts. This insect has been most frequently brought to notice as a parasite of the very destructive army worm, *Heliothia unipuncta* Haw. on which it is a very efficient check. The army worm was abundant in many localities throughout the country in 1896, when the numerous oblong, silken cocoons of this parasite attracted Professor Lugger's attention in Minnesota fields infested by army worms. This is the best evidence obtainable of its value as a parasite. We have reared it from the zebra caterpillar, *Mamestra picta* Harr. another injurious species, the grub emerging from the larva and pupating July 24, the adult appearing Sep. 13. Records indicate this to be one of the most valuable species of the genus, since it preys on several insects of considerable economic importance. It has been reared in addition to those named above, from *Mamestra trifolii* Rott, *Scoliapteryx libatrix* Linn., *Schizura cinna* Abb. & Sm., and *S. unicornis* Abb. & Sm. It has also been bred from a dipterous *Solidago* gall and several unidentified lepidopterous larvae. It probably has a number of other hosts. We have also seen a specimen reared from the *Polyphemus* caterpillar, *Telea polyphemus* Cram., in the Museum of Comparative Zoology at Cambridge Mass.

Description. Fulvo-ferruginous; stigma small; two subtriangular, opaque chitinous spots in the cubitodiscoidal cell.

Head medium; antennae nearly as long as the body; ocelli black, about equidistant from each other and the eyes; dorsal and posterior portions of head yellow; mandibles bidentate and tipped

with black. Thorax sericeous; mesothorax convex; scutellum and postscutellum prominent; metathorax slightly depressed anterior of the transverse carina; lateral carinae distinct. Wings hyaline; marginal nervure thickened and slightly sinuate near the stigma; cubitodiscoidal nervure usually strongly sinuate but not appendiculate, its bulla scarcely one fourth the width of the third discoidal cell from its apex; two subtriangular opaque spots occur in the glabrous area of the cubitodiscoidal cell, the larger one with no arcuate continuation along the margin of the glabrous area, though a small chitinous line may be seen near the smaller spot.

Legs honey yellow; abdomen strongly compressed, darker at the tip; first and second segments remarkably long and slender; claspers of male subtriangular, obliquely truncate, acute posteriorly.

Length about 22 mm, wing spread about 26 mm. Described from numerous examples.

The cocoon is a silken, brown, tough, oblong oval object.

Distribution. The recorded distribution of this insect is as follows: New England, New York, New Jersey, Pennsylvania, Virginia, Carolinas, Florida, Alabama, Illinois, Indiana, Missouri, Iowa, Colorado, Arizona, Nevada, California and Canada. Examples of this species from Georgia, Oregon and Washington, in addition to some of the states named above, occur in the collection of the Academy of Natural Sciences at Philadelphia. Specimens of this species are now before the writer from the following localities: Kansas; California; Virginia; Fox Point, Alaska [Harri-man Expedition '99]; Flatbush N. Y., Victoria Tex., St Louis Mo., Durham N. H., and Arizona, all being in the collections of the United States National Museum. Specimens from Colorado, Las Vegas N. M., Cheyenne Wy., and Michigan were lent to the writer by Professor Gillette. Specimens from New York were received from Mr L. H. Joutel, and Mr W. W. Harrington kindly sent examples from Grimsby Ont. (taken June 6), Toronto (taken July 27, Aug. 24 and Sep. 3), Winnipeg (taken in June), Osoyoos B. C. (taken in May) and from Ottawa, Canada. Specimens from Malden and Amherst Mass. (taken Aug. 1, 2, 12 and 21) were lent to us by Prof. C. H. Fernald. The species is doubtless distributed over the whole of the United States and the larger *portion of Canada.*

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- 1878 ——— Mass. State Bd Agric. 25th Rep't, p.252 (Parasite of *H. unipuncta*)
- 1883 ——— U. S. Ent. Com. 3d Rep't, p.128, pl.2, fig.5 (Parasite of *H. unipuncta*; eggs, habits of larva described)
- 1888 ——— N. J. State Bd Agric. 15th An. Rep't 1887, p.523, fig.1 (Mention)
- 1875 **Cresson, E. T.** Geog. and Geol. Sur. Ter. Rep't. Zool. 5:708 (From eastern Nevada)
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- 1887 ——— 16:34
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- 1884 **Caulfield, F. B.** Can. Ent. 16:122-23 (Parasite of *Mamestra picta*; cocoon described)
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- 1888 **Lugger, Otto.** Univ. Minn. Bien. Rep't Regents, p.306-67, fig.31 (Parasites of *H. unipuncta*)
- 1896 ——— Ent. Minn. Agric. Exp. Sta. 2d Rep't, p.17, fig.10 (Abundant in fields with army worm)
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- 1890 **Webster, F. M.** U. S. Dep't Agric. Div. Ent. Bul. 22, p.46 (Reared from *Scoliopteryx libatrix*)
- 1893 ——— O. Agric. Exp. Sta. Bul. 45, p.169
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- 1890 **Riley, C. V. & Howard, L. O.** Insect Life, 2:382 (Reared from *Scoliopteryx libatrix*)
- 1890 ——— 2:155 (Bred from *Mamestra trifolia*, *Schizura unicornis* et al)
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Eniscopilus arcuatus Felt

This comparatively rare species may be easily separated from *E. purgatus* Say, with which it has heretofore been confused, by the well marked chitinous, usually yellowish, arcuate continuation of the larger opaque spot in the cubitodiscoidal cell. This structure extends along the posterior border of the glabrous area in that cell to a point beyond the smaller opaque spot. It may also be recognized by the bulla of the cubitodiscoidal cell being at a distance equal to one half the width of the third discoidal cell from the apex of the same [pl. 1].

This species was described in the February issue of *Psyche*, 1902, page 307-8, and its characterization is reproduced herewith:

Light fulvo-ferruginous, the larger opaque chitinous spot of the cubitodiscoidal cell with a distinct arcuate continuation extending along the hinder margin of the glabrous area and partly around the smaller chitinous spot.

Head medium, yellowish posteriorly, face yellowish, antennae slightly longer than the body; ocelli black, equidistant; mandibles bidentate, fuscus apically. Thorax, sericeous; mesothorax, convex; scutellum and postscutellum, prominent, the former yellowish; metathorax slightly depressed in front of the transverse carina; lateral carinae distinct. Wings hyaline, having hardly a trace of the fuscus visible in *Ophion* (*Eniscopilus*) *purgatus* Say; marginal nervure slightly thickened and sinuate near the small stigma; cubitodiscoidal nervure, weakly sinuate, not appendiculate; its bulla one half the width of the third discoidal cell from its apex; two subtriangular opaque spots in the glabrous area of the cubitodiscoidal cell, the larger one with a chitinous, usually yellowish continuation along the hinder margin of the glabrous area to a point beyond the smaller chitinous spot, which latter is anterior and lateral of the center of the glabrous area. Legs, honey yellow. Abdomen, strongly compressed, slightly darker at the tip, the first and second segments being very slender. The claspers of the male are rounded apically.

Length about 23 mm. Wing spread from 30 to 35 mm.

Habitat, Albany N. Y. May 6, 1876 [W. M. Hill]; Ithaca N. Y., July 16, 1889 [J. M. Stedman]; New York city [L. H. Joutel]; Malden Mass. [C. H. Fernald]; Poughkeepsie N. Y. [Young, collector]; South Britain Ct. 1884 [G. F. Pierce].

There are examples of this species from Cambridge Mass. in the collection of the Museum of Comparative Zoology, and from Georgia and New Hampshire in the collection of the Academy of Natural Sciences of Philadelphia. There is a specimen in the collections of the United States National Museum labeled "Coll. C. V. Riley," and one in the Bolter Collection at the University of Illinois from Illinois. Types are in the New York State Museum and also at Cornell University.

***Eniscopilus appendiculatus* Felt**

This form is even rarer than the preceding. It was originally described from one specimen which came into my possession through the kindness of Dr J. B. Smith, New Brunswick N. J. This specimen probably came from New Jersey and is deposited as a type in the New York State Museum. A study of the collections of others has revealed two specimens in the collections of the United States National Museum, one marked "Collection C. V. Riley" and the other "From Selma, October 1880, W. H. Patton." This form is evidently southern in its habitat and it may be separated from the preceding species by the following characteristics which were given in the February issue of *Psyche*, 1902, page 308:

Light fulvo-ferruginous, larger opaque spot of the cubitodiscoidal cell with a small extension on its posterior angle. The smaller chitinous spot is nearly circular, light yellow in color and slightly posterior to the center of the glabrous area [pl. 2, fig. 4].

This species differs in addition to the above characteristics from the preceding one in having the cubitodiscoidal nervure slightly angled and not sinuate. It is a smaller form, having a length of 18 mm and a wing spread of about 27 mm.

Table of species of *Ophion*

a Wings hyaline

b Body usually strongly compressed, eyes large, extending nearly to the base of the mandibles

c Medium size, metathorax not areolated, male clasp subtriangular *bilineatum* Say

cc Small, metathorax usually strongly areolated, male clasp short, rounded apically..... *tityri* Pack.

bb Body stout, not strongly compressed, eyes small, distant from base of mandibles

- c* Cubitodiscoidal nervure usually not appendiculate
d Ferruginous or fulvous.....*bifoveolatum* Brullé
dd Ferruginous varied with black and venter of mesothorax usually black*nigrovarium* Prov.
cc Cubitodiscoidal nervure appendiculate, appendix extending into second discoidal cell*abnormum* Felt
aa Wings subhyaline
b Wings distinctly ferruginous*ferruginipennis* Felt
bb Wings yellowish, fuscous along apical costal margin..*costale* Cress

Ophion bilineatum Say

Two-lined Ophion

This species, next to the long-tailed and purged Ophions, is the most abundant in collections and the one most frequently noticed in entomologic literature. It may be easily separated from the other more common forms by its medium to large size, strongly compressed abdomen, by the subtriangular, obliquely truncate male clasps and the appendiculate cubitodiscoidal nervure.

Life history and habits. Very little is recorded concerning the life history and habits of this species. Its comparative rarity in collections is probably explained by its crepuscular or nocturnal habits, since our trap lantern record indicates that it is one of the most abundant forms attracted to light.

Trap lantern records

1889																																
	JUNE		JULY		AUGUST											SEPTEMBER																
	4	30		3	1	4	21	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	11	12	13	14	15	16	17	18	19
Male....	...	1	.....	...	...	...	1	...	...	...	...	...	1	1	2	...	2	...	1	...	1	...	4	2	...	...	1	...	2	...	4	...
Female..	1	...		1	1	1	1	3	1	4	4	4	1	1	5	12	20	6	8	9	1	3	13	3	8	37	32	14	12	59	17	25

1889															1892																	
SEPTEMBER												OCT.			AUG.		Total	MAY		JUNE		SEPTEMBER										Total
	20	21	22	23	24	25	26	27	28	29	30	1	2	5	10	22			20	28	11	14	16	19	20	23	24	25	30			
Male...	..	1	..	..	2	3	..	..	..	..	..	1	..	..	..	..	30	.....	1	1	..	..	..	..	..	..	..	..	2			
Female	21	14	2	1	7	18	17	2	3	3	11	9	1	1	1	2	420	3	.....	2	1	1	1	1	1	2	1	1	13			

It will be seen by the above, that there is some indication of periodicity in the captures, though nothing but what might be caused by more or less favorable weather or the relative abundance of the insects. There is certainly no indication of more than one brood. It will be noticed that this species flies most abundantly from about the middle to the last of September, and may be found on the wing till nearly the middle of October.

Hosts. Very little is known regarding the species on which this insect preys. The record is so meager that one can only surmise as to the economic value of this parasite. It has been reared from *Diacrisia virginica* Fabr. *Feltia gladiaria* Morrison, and *Glaea inulta* Grote. Dr Howard has recorded this species as possibly a parasite infesting *Notolophus leucostigma* Abb. & Sm. to a limited extent. This brief record suggests that this species may be parasitic on some of the arctians and noctuids, and while the former are not of much economic importance, such is not true of many of the latter, and in the control of these, this species may play an important part.

Description. Fulvo-ferruginous, stigma well developed, medium size to rather large; length of body about 19 mm; wing spread about 30 mm.

Head medium, antennae as long or longer than the body; eyes and ocelli black; lateral ocelli a little distant from the eyes; dorsal and dorsocaudal aspect of head yellowish; mandibles bidentate and tipped with black. Mesothorax convex; scutellum and postscutellum prominent; metathorax with inconstant raised lines. Wings hyaline with a glabrous elliptic spot near the stigma in the cubitodiscoidal cell; cubitodiscoidal nervure appendiculate [pl.2, fig.3]; legs honey yellow. Abdomen rather strongly compressed, frequently a little darker at the extremity; male claspers subtriangular, obliquely truncate, and acute posteriorly.

Described from numerous specimens.

There are some very small representatives of this species from the Adirondack mountains that approach closely in size and general appearance the following form. They may be separated, however, by the relatively shorter, more compressed abdomen and by the thorax being as dark as other portions of the body.

Distribution. This insect has a wide distribution over the United States and the southern portion of Canada, though it has

not been reported from every state in the Union. Its recorded distribution is as follows: New England, New York, New Jersey, Virginia, Maryland, District of Columbia, Florida, Louisiana, Michigan, Iowa, Missouri, Colorado, Texas, Montana, Nevada, Lake Winnipeg and Sudbury, Ontario.

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- 1883 Saunders, William. Ins. Inj. Fruits, p.273, fig.282 (Parasite of *Spilosoma virginica*)
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- 1890 Riley, C. V. & Howard, L. O. Insect Life, 3:155 (Bred from *Glaea inulta* and *Agrotis morrisoniana*, *habitat*)
- 1890 Ashmead, W. H. Col. Biol. Ass'n Bul. 1, p.43 (Listed)
- 1890 Perkins, C. H. Vt. State Bd. Agric. 11th Rep't, separate, p.10 (Mention)
- 1890 Smith, J. B. Cat. Ins. N. J. p.25 (Not common at Caldwell)
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- 1892 Osborn, Herbert. Part. Cat. Animals Ia. p.15 (Common)
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Ophion tityri Pack.

This species resembles *O. bilineatum* Say closely in its general appearance, and it may be an earlier occurring dimor-

phic form but we have no evidence of this and for the present it must be regarded as a distinct species. It may be separated from the preceding by its smaller size, relatively shorter and flatter abdomen, and by the difference in the form of the male genitalia.

Life history and habits. Comparatively little is known of the life history and habits of this insect, since it has been so frequently confused with *O. bilineatum*. There appears to be but one published notice of this parasite since its description in 1882, and in that it is not recognized as a distinct form. This species can hardly be regarded as rare, since over 100 individuals were taken in the trap lantern experiments at Cornell University and it has been frequently collected by the writer and also met with in other collections.

Trap lantern records

		1889																			
		MAY																			
		5	7	8	9	10	11	14	15	16	17	18	19	20	21	22	24	25	26	28	
Male				1			1	2	1	2	2	4	10	2	1	2	1	3	2	1	
Female ...		1	1	1	3	1	1	3	1	9	4	1	7	3	4	1	3	3	3	....	

		1889																				
		JUNE												JULY					Aug.			
		2	3	4	5	6	8	11	13	16	17	19	27	29	1	2	3	23	31	1	2	17
Male .....	....		1				2											1				
Female ..		2	2	1	1	2	1	1	1	2	2	1	1	2	1	1	1	3	1	2	1	1

	1890												1892											
	SEP.		Total	MAY		JUNE								JULY								AUG.		Total
	27	30		28	1	2	4	5	9	19	21	28	1	6	16	17	25	26	28	2	6			
Male .....	.....	.....	39	.....	.....	1	1	1	1	1	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	7			
Female ..	1	1	79	1	.....	1	1	.....	.....	3	1	1	1	1	.....	1	1	1	1	1	16			

A glance at the above table will show that this insect has a well defined period of flight, and one that does not overlap the time *O. bilineatum* is abroad, except in the case of scattering individuals. This species appears early in May, is most abundant the latter part of the month, and occurs somewhat rarely during June with belated individuals in July, August and September, while *O. bilineatum* does not occur till August and then only in scattering numbers till the latter part of the month. This marked difference in the time of flight between these two parasites indicates that either they are two broods of the same insect or else that they are distinct species. The structural difference to be described later must be regarded as proofs of their distinctness. The large eyes and many individuals taken in the trap lantern indicate a crepuscular or nocturnal habit.

Hosts. This parasite has been reared from *Epargyreus tityrus* Fabr. Prof. G. C. Davis, when at the Michigan Agricultural College Experiment Station, wrote us that he had bred the insect repeatedly from *Halisidota caryae* Harris and *Symmerista albifrons* Abb. & Sm. It is probably parasitic on a number of other related insects.

Description. Ferruginous or fulvo-ferruginous with frequently a decidedly fulvous tinge on the thorax, which latter is shorter and the abdomen considerably shorter than in *O. bilineatus*. Face ferruginous, or laterally fulvous; head medium; mandibles bidentate, tipped with dark brown, clypeal fossae deep, antennae usually longer than the body; the fossae at their bases not deep; eyes large, reaching nearly to the base of the mandibles. Ocelli black, nearly contiguous and the posterior close to the eyes. Thorax short, ferruginous or fulvo-ferruginous; mesothorax convex; scutellum and postscutellum prominent; metathorax usually with very prominent carinae inclosing deep, four sided areas, and the pedicel of the abdomen surrounded by a high carina. Wings hyaline; cubitodiscoidal nervure strongly appendiculate. First recurrent nervure only about one third the length of the second; bulla of the latter close to the cubitodiscoidal nervure, and that of the latter nearer the second discoidal nervure than the appendix. Legs long, fulvo-ferruginous; abdomen much shorter than in *O. bilineatus*, very strongly compressed and the posterior segments usually darker in color. Clasps of male subtriangular, obtusely rounded, length 14 mm, wing spread 26 to 30 mm. Described from numerous specimens of both sexes.

Distribution. This species is widely and probably generally distributed in the northern United States and southern Canada. It was described from Massachusetts, has been met with in numbers at both Albany and Ithaca N. Y. and was repeatedly reared by Professor Davis in Michigan. In addition we have specimens before us from New York city [Joutel]; Ottawa, May 19, 24 and June 8, Toronto, August 24, Grimsby, June 6, Port Hope, May 5, and Vancouver Island, May 3, all from Canada through the kindness of Mr W. H. Harrington.

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Ophion bifoveolatum Brullé

This species is one of the more common forms belonging to the genus and if one may judge from trap lantern records, it is largely diurnal and not crepuscular or nocturnal as in the case of some of its close allies. This conclusion is further borne out by the reduced size of the eyes, being decidedly smaller than in related species and distant from the mandibles. This species occurred in the trap lantern material taken at Ithaca in very small numbers compared to those of the closely allied *Ophion bilineatum* Say. It has a somewhat exceptional host in white grubs, compared with other members of the genus and so far as known to us has not been reared from any other species.

Description. Fulvo-ferruginous with small eyes distant from mouth; costal vein inclined to black; cubitodiscoidal nervure rarely appendiculate; bulla of the second recurrent nervure usually close to tip of cubitodiscoidal nervure and abdomen less compressed than in its close allies.

Head medium; face frequently fulvous laterally, broad; mandibles stout with black tips; clypeal fossae deep and usually black; antennae dark brown, stout and not as long as the body; ocelli black and equidistant. Thorax sometimes dark brown, finely punctured and with sutures more or less black; mesothorax convex; scutellum and postscutellum prominent, the former sometimes a light ferruginous; dorsum of metathorax is usually smooth. Wings hyaline; stigma well developed; costal

and adjacent veins inclined to black; cubitodiscoidal vein usually smoothly arched and rarely appendiculate; bulla of second recurrent nervure usually close to tip of cubitodiscoidal nervure [pl. 2, fig. 2]. Legs uniformly ferruginous; claws pectinate. Abdomen sometimes slightly darker at tip and not strongly compressed but relatively thicker and shorter. Male clasps stout, rather long, obliquely rounded and rather acute at tip.

Length about 15 mm. Wing spread about 28 mm.

This species occurs abroad during the latter part of May and very early in June. Specimens are at hand from Ottawa, Canada taken May 30 and June 6 [Harrington]; Fort Lee N.J. taken May 29 [Joutel]; Malden Mass. taken May 4 [Fernald]; Belfrage Tex., Washington D.C., taken in May [United States National Museum] besides various New York localities. This species has been recorded from the following localities: Mt Washington N. H., New Jersey, New York, Illinois, Iowa, Colorado and Texas. The record of captures in trap lanterns at Ithaca in 1889 and 1892 is given below:

Trap lantern records

	1889								1892										
	MAY		JUNE						Total	MAY	JUNE								Total
	24	26	3	4	8	21	26	30		1	2	3	8	11	16	25	28		
Male											1			1	1			3	
Female	1	1	1	1	1	1	1	7	3	2	1	2	1	1	1	1	1	13	

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Ophion nigrovarium Prov.

This species is undoubtedly closely related to the preceding form, though we have been unable to examine the original type. A few specimens from Colorado which we provisionally assigned to *O. bifoveolatum*, are exceptionally highly colored, and they probably belong to this species; in which event we are inclined to believe that it is but a variety of the preceding. A translation of the original description is as follows:

♂ Length .6 inch (pouce). Yellowish red varied with black. Head yellow; base and tip of the mandibles, two punctures on the top of the clypeus, the fossa at the insertion of the antennae, with the eyes are of a more or less deep brown. Eyes short, with almost no slope above. Posterior ocelli distant from each other, but close to the eyes. Antennae stout and short, brown. A puncture before the tegulae; the scutellum pale yellow. Thorax yellow; superior border of the prothorax, base of the scutellum, base of the metathorax, its sutures, upper sides of mesothorax, base of the four posterior coxae, black. Metathorax without distinct carinae. Wings slightly smoky; costal nervures brown, stigma yellow. Feet yellow, the anterior coxae in front and the posterior coxae behind more or less spotted with brown. First and second segments of abdomen brown; the posterior segment also brown on the inferior border.

♀ Of a clearer yellow than the ♂. Coxae entirely yellow, except in their articulation with the body. Base and extremity of abdomen of a deep shade of brown. Otherwise like the male. Described from two specimens. Inhabits Canada. [*Nat. Can.* 6:104]

Ophion abnormum n.sp.

A single specimen of this form was received from Colorado through the kindness of Prof. C. P. Gillette, who labeled it no. 2103. This species is very closely allied to what we have considered a light form of *O. bifoveolatum* Brullé.

Description. Fulvous, with indistinct ferruginous markings on the thorax and abdomen, except that the dorsum of the thorax has two distinct submedian fulvous lines and its lateral margins are also bordered by stripes of the same color. Wing spread 18 mm, length of body about 15 mm.

Head medium, face short, mandibles bidentate, tipped with dark brown or black; clypeal fossae deep, dark brown; antennae slightly shorter than the body; eyes black, small, somewhat dis-

tant from the mandibles. Ocelli glassy or black, well separated and the posterior ones distant from the eyes; thorax glassy; mesothorax convex; scutellum and postscutellum conspicuous; metathorax evenly rounded with no carinae. Wings hyaline; nervures and stigma brown, the latter with fulvous markings; cubitodiscoidal nervure plainly appendiculate, the appendix extending into the second discoidal cell; bulla of second recurrent nervure close to the cubitodiscoidal nervure, and that of the latter nearly equally distant between the appendix and the second recurrent nervure [pl. 2, fig. 5]. Legs ferruginous; claws pectinate; abdomen stout, not strongly compressed.

Described from one female from Colorado.

Ophion ferruginipennis n. sp.

One example of this unique form was in the collection of the United States National Museum and through the kind forbearance of Dr Ashmead its characterization has fallen on the writer. Another specimen was taken by Mr L. H. Joutel in the vicinity of New York city.

Description. Ferruginous; wings ferruginous and with a spread of about 40 mm; metathorax strongly areolated in much the same way as in *O. tityri* Pack.

Head medium; mandibles bidentate; black apically; clypeal fossae deep; antennae nearly as long as the body. The fossae at their bases are well marked. Eyes large, extending nearly to the mandibles; ocelli black and the posterior pair almost contiguous to the eyes; thorax sericeous; mesothorax convex; scutellum and postscutellum prominent. Metathorax with two well developed transverse carinae and a number of longitudinal ones radiating from the insertion of the first abdominal segment. Wings subhyaline with a distinct ferruginous and, in places, fuscous tinge, specially at their base and along the anterior margins. Cubitodiscoidal vein with its appended vein stub extending one third across the cell from the well marked angle; bulla of second recurrent nervure a little distance from the cubitodiscoidal vein [pl.2, fig.1]. Legs light ferruginous, concolorous; claws pectinate; abdomen strongly compressed and somewhat darker at the tip. Length about 25mm, wing spread about 40 mm.

Described from two females. One is in the collection of the United States National Museum and the other in the New York State Museum,

Ophion costale Cresson¹

This rare species is represented by only one individual, the type being in Mr Cresson's collection. It may be that this form is but a sport, though at present we can do no better than to allow it to stand as a distinct species.

Description. Female. "Fulvo-ferruginous, shining, face broad, the middle closely punctured, subtuberculate immediately beneath base of antennae; clypeus strongly punctured, tips truncate, lateral sutures and tips of mandibles black; cheeks swollen; antennae shorter than usual, reaching about to tip of second abdominal segment; mesothorax convex, polished; scutellum very convex; metathorax confluent punctured, without transverse carina, sutures of thorax narrowly black; wings subhyaline, stained with yellowish at base and with fuscous along apical costal margin, darkest at tip of marginal cell; basal margin of third and fourth abdominal and an oblique mark on sides of second segment, black." Length 13 mm. Habitat: Klamath county, Cal.

"Readily distinguished from all other species known to me by the ornamentation of the wings." [Cresson]

Genophion n. gen.

This genus is proposed to include certain forms remarkable for the development of the lower portions of the head, resulting in a very elongate face and considerable distance between the normal sized eye and the base of the mandible. This is specially marked in *Genophion gilletti* Felt, the generic type.

Table of species

<i>a</i> Wings fulvo-fuliginous	<i>gilletti</i> Felt
<i>aa</i> Wings with a distinct fulvous tinge.....	<i>coloradensis</i> Felt

Genophion gilletti n. sp.

This small form resembles *O. coloradensis* Felt, but may be easily separated from it by its shorter antennae, longer face and the dark fuscous coloration of the wings. It is described from one female from Colorado, no. 2565, kindly sent me by Prof. C. P. Gillette, in whose honor it is named.

Description. Dark ferruginous, with the head and thoracic sutures black and the wings tinged with dark fuscous. Wing spread about 18 mm, length of body 9 mm.

¹1878 Cresson, E. T. Acad. Nat. Sci. Phila. Proc. p.303.

Head large, face very long with a large, evenly rounded labrum; mandibles stout, bidentate, tipped with dark brown or black, and with black at the extreme base; clypeal fossae black and almost connected with the base of the mandibles by black impressed lines; antennae shorter than the body, stout and with the first joint of the flagellum much longer and more slender than the second; antennal fossae ringed with black and with a conspicuous, impressed, black area above; eyes rather small, distant from the base of the mandibles; ocelli glassy or black, the two lateral distant from the eyes and each connected therewith by a deep, impressed, black line. Thorax glassy with deeply impressed, jet-black sutures; mesothorax highly convex; scutellum and post-scutellum prominent; metathorax smoothly rounded and with no well developed carinae. Wings distinctly fulvo-ferruginous; cubitodiscoidal nervure uniformly arching, not appendiculate; first recurrent nervure less than one fourth the length of the second; bulla of the second recurrent nervure close to the cubitodiscoidal nervure, and that of the latter distant from the second discoidal nervure by one half its length. Legs uniformly ferruginous, except the trochanter segments which are black at their base; claws pectinate; abdomen strongly compressed, first segment slender and gradually enlarging at its apical fourth.

Genophion coloradensis n. sp.

This is a small form having somewhat the general appearance of *O. tityri* Pack., but differing from it in a number of particulars. It is described from two female specimens in the collection of the United States National Museum.

Description. Ferruginous with the thoracic sutures black, wings tinged with fulvous, wing spread 20 mm, length 9 mm.

Head medium; face long; mandibles bidentate, tipped with dark brown or black; clypeal fossae deep, dark brown; antennae about as long as the body, the fossae at their bases well marked and ringed with dark brown. Eyes medium, distant from the mandibles. Ocelli glassy or black, nearly contiguous, distant from the eyes; thorax sericeous, with black sutures; mesothorax convex; scutellum and postscutellum prominent. Metathorax with three well developed carinae, one dorsal, two lateral, radiating from the insertion of the first abdominal segment. Wings subhyaline, with a distinct fulvous tinge, specially on the hind wings. Cubitodiscoidal vein variably appendiculate (in one only a notch and in the other well marked); first recurrent nervure less than one half the length of the second; bulla of second recurrent nervure near cubitodiscoidal nervure, that of the latter at

proximal third of distance from the appendix to the second recurrent nervure. Legs light ferruginous, basal articulations variably marked with dark brown, claws pectinate. Abdomen strongly compressed, first segment slender, gradually enlarging at apical third.

Described from two females from Colorado.

INJURIOUS INSECTS

Chrysanthemum lace bug

Corythuca marmorata Uhler

Ord. Hemiptera Family Tingitidae

Members of this family have been characterized by Professor Comstock, in the following terms: "Dainty as fairy brides are these tiny, lace-draped insects. One glance at the fine, white meshes that cover the wings and spined thorax is sufficient to distinguish them from all other insects, for these are the only ones that are clothed from head to foot in a fine white Brussels net." This very fitting description applies to all members of the family, and where such insects are found on chrysanthemums, they are very likely to be this species. This group is not only unusual in appearance, but is also one rarely brought to the attention of the economic entomologist. This is particularly true of the species under consideration, concerning which comparatively little is known. It was described in 1878 from North Carolina but with no indication of its food habits. The next record appears in 1898 and relates to an attack the preceding year on chrysanthemums in Alabama.

This insect was brought to our notice last July by Mr Harry Blauvelt of Coeyman, who stated that it had caused considerable injury the past two or three years, and that he feared a repetition of the attack this season. His brother, Mr Egbert Blauvelt, observed that it bred abundantly on ragweed and also on some other which he was unable to identify. Specimens of the insect were colonized on potted plants and the accuracy of the complaint established beyond question. The little pests fed vigorously on the foliage, laid numerous eggs, many young developed and soon

one plant after another assumed an unhealthy appearance and died. The attack was characterized in particular by a discoloration of the leaves accompanied by a dark spotting, due to excrement, and the cast skins of the young were also abundant. The general appearance of a badly infested leaf is shown on plate 3.

Life history. The breeding of this insect was placed in Mr C. M. Walker's charge, but owing to pressure of other work he was unable to give it all the attention desirable. He learned, however, that the eggs were laid on the underside of the leaf, being thrust under the epidermis along the larger leaves and veins, leaving only the small, yellowish, conical cap in sight. The eggs soon hatch and the young develop rapidly, since between June 11 and 23 a life cycle was nearly completed. The feeding of the insect causes white, irregular blotches to appear, and if the attack is at all severe, withering of the leaves. The various molts follow each other quickly and the cast skins soon become so abundant as to give the impression of a bad infestation, whereas only a few bugs may be present. The insects are very active and pass readily from one plant to another, though none of the adults were observed to fly.

Description. This species has been the object of considerable study, and the following descriptions and the original illustrations were made under our direction by Mr C. M. Walker. It is believed that all stages are described below though they were not obtained by close breeding.

Egg [pl.4, fig.1]. Length about .5 mm, width .25 mm. Ovate, somewhat fusiform; visible tip truncate, collared, within which is a small, yellowish, ridged conical cap which is displaced by the young when it emerges.

Stage 1. Length .5 mm, breadth one third of length; antennae stout, with numerous long spines; three segmented, the terminal segment being about twice the combined length of the first and second. Legs stout, and about as long as the insect. There are simple spines arising directly from the body [pl.4, fig.2b], and also much shorter, compound ones originating from cone-shaped bases [pl.4, fig.2a]. Each abdominal segment bears on its lateral margin a single somewhat trumpet-shaped, compound spine on a conical base [pl.4, fig.3]. Two oval openings occur on the dorsal line of the posterior margin of the third and fourth abdominal segments. These may possibly be analogous to the odoriferous *glands which occur in certain other species of Heteroptera.*

Stage 2 [pl.4, fig.4]. Length 1 mm, width .4 mm. Form broader in proportion to length than in the first stage, and the legs are much shorter. The chief difference between this and the preceding stage, is in the size and number of spines. The dorsal, compound spines, which in stage 1 arose from conical bases, have become much thickened, taper to a point and are about one fourth the length of their bases, which latter are enormously developed and thickly studded with chitinous projections [pl.4, fig.5a]. The long simple spines arising directly from the body, are shorter and their bases narrow [pl.4, fig.5b]. The marginal, compound spines of each abdominal segment have lost all resemblance to their previous form. Their rugose, spined bases have become thickened and are about twice the length of the spine, which latter is narrowed to a sharp point.

Stage 3. Length 1 mm, width .5 mm. The terminal segment of the antenna is about two and one half times the combined length of segments 1 and 2. In this stage the compound dorsal spines mentioned in the preceding have apparently suffered little change, but their bases have increased five times the length of the spines, and are correspondingly stouter and rougher [pl.4, fig.7a]. The simple spines situated near these latter have not changed much, though they are somewhat longer than in stage 2 [pl.4, fig.7b]. The bases of the lateral abdominal, compound spines are four times the length of the spines [pl.4, fig.8a], which latter have not changed in appearance. Contiguous to these, singly or in pairs, are other shorter compound spines on conical projections about twice their own length [pl.4, fig.8b].

Stage 4 [pl.4, fig.9]. Length 1.5 mm, width .75 mm. Form ovate, tapering anteriorly. Head nearly as wide as long, obtusely rounded with the lateral margins behind the eyes arcuate, hind angles rounded. Antennae four segmented, segment 3 a little longer than the fourth, which is about equal to the combined length of 1 and 2, the last being about one half the length of the first. Rostrum stout, dark at tip and extending to about the base of the first abdominal segment. Head, bearing four groups of compound spines on tubercles or bases of varying size and length arranged as follows: a median pair at the anterior margin; three directly back of these, the central one being smaller; two groups of five of various lengths, each a little behind the eye and halfway between the median line and the lateral margin. A long simple spine is also found at the base of each of these groups.

Prothorax tapering anteriorly, three times as broad as long; with two median pairs of grouped compound spines at about equal distance from the anterior and posterior margins, the anterior pair with two smaller spines at their bases. Laterally there is a group of three compound spines at the apical angle

of the prothorax, the central one largest, and another of five at the posterior angle, three being much larger than the others. The wing pads are seen for the first time and extend to the anterior margin of the second abdominal segment. There are two sublateral groups, each consisting of two compound spines, one larger, one smaller and a simple one, near the posterior margin of the mesothorax. The anterior lateral margin is armed with a stout spine similar to that on the preceding segment, and on the posterior angle there is a group of five compound spines similar to those on the prothorax.

The abdomen consists of 10 segments, numbers 2 and 3 having a single lateral spine, while segments 4 to 8 are each ornamented with lateral groups of three compound spines [pl.4, fig.10], one being nearly twice the length of the other two. Segment 9 bears only one on each side. There is also a slender, hairlike spine of considerable length at the base of each group of spines on segments 2 to 8. Segments 2, 5, 6, 8 and 9 each bear a median pair of long, stout, compound spines [pl.4, fig.11a], each of which, with the exception of those on segments 2 and 9, has a simple spine at its base [pl.4, fig.11b]. The so called odoriferous glands appear as in the younger stages on the dorsum of the third and fourth segments. Certain extremely minute projections, with enlarged extremities are scattered over the body, arising directly from its surface. There are also more numerous chitinous points generally distributed and which give the body a brownish appearance.

Stage 5. Length about 2 mm, width nearly 1 mm. The first two segments of the antennae are about equal in length. The third is longest and not quite twice the length of the fourth [pl.4, fig.13]. The wing pads extend to the fifth segment of the abdomen, which latter is nearly fusiform, tapering anteriorly from the extremity of the wing cases. The dorsal spines are relatively much larger and more specialized and the lateral groups on the thorax and abdomen, excepting the last segment of the latter, are distinctly pediceled [pl.4, fig.12]. This is also true of the anterior median pair of the prothorax, which almost coalesce, and of the median pair of the mesothorax.

The original description of the adult is as follows: "Form similar to that of *T. arcuata* Say. Body black, the humeral region and pleural margins sometimes paler, or piceous; the venter polished, minutely, transversely wrinkled. Bucculae highly elevated, white; antennae slender, the apical joint sometimes dusky. Pronotal vesicle high, extending far forward, regularly arching over the head, abruptly compressed anteriorly for more than half its length; the meshes large, two larger ones occupying the basal breadth; the nervures more or less embrowned, that of the middle carinate, much elevated, entire.

Most of the nervures with short spines, which in some specimens are obsolete. Lateral lobes of pronotum short, prominent, semi-circular, having the same curve anteriorly as posteriorly; narrower than the base of the hemelytra, with large, rather regular cells; the nervures of the middle tinged with brown; a brown spot exteriorly and sometimes a second spot at the posterior margin; the marginal spines long and slender. Processus divided into cells as far as the tip; only the base of the lateral margin elevated, the middle carina high, not so high as the pronotal vesicle, gradually declining to the tip, the base arched, bearing two large areoles surmounted by a series of smaller ones, the upper edge spinous. Raised margin of the sternum whitish, the metasternum circular, auriculate each side. Legs pale honey yellow, embrowned at tip and on the tarsi. Hemelytra rather quadrangular, with the basal angles very acute, very widely removed from the pronotal lateral lobes, the basal margin distinctly concave; lateral margins spinous until a little beyond the middle, the tips widened, bluntly, broadly rounded; areoles large, next to the apical series is a transverse row of three or four very large ones, usually connected with another large one in front exteriorly; vesicular elevations small, with a high carina, spinous, bearing posteriorly a brown spot; a brown spot exteriorly near the basal angle, another submarginal near the middle, and a broad brown band at tip which omits the subapical series of large areoles.

Length, 3 mm. Breadth at base of hemelytra, $1\frac{1}{2}$ mm."

Remedies. This little pest being a sucking insect, can be controlled only in two ways. Clean culture will probably prove the most effective method of checking its depredations, since it would mean the destruction of weeds and various plants on which the insect could breed. There is little probability of the pest developing in large numbers if the vicinity of a chrysanthemum field is kept clear of weeds. The pest may be severely checked, if not nearly destroyed by thorough spraying with a whale oil soap solution, using 1 pound to 9 gallons of water, according to Mr Egbert Blauvelt. It is very probable that pyrethrum powder, or better still, hellebore could be used wherever a limited number of plants require treatment.

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NOTES FOR THE YEAR

The season of 1903 has been marked in particular by an unusually severe outbreak of plant lice of various species, some of which continued their depredations over an abnormally extended period. These insects were so destructive and generally present on various plants in different sections, that observations relating thereto have been grouped under a separate head. Species depredating on other plants and products of value, have been grouped under convenient headings for the purpose of facilitating ready reference to the various accounts.

Plant lice

The season of 1903 may well be remembered on account of the exceeding abundance of these little insects, particularly of species of economic importance. This is an exceedingly interesting group, and their almost absolute helplessness and enormous prolificacy illustrate one of nature's provisions against the extermination of a species. Despite their apparent weakness, these little creatures are well able to hold their own, as many farmers know to their cost. This group is at present represented in America by the relatively large number of 325 species, as given by Professor Hunter in a recently issued list.

The conditions which control the abundance of these forms are not well understood, though in all probability they are largely climatic, supplemented by the beneficial work of various natural enemies. Some believe that dry weather is favorable to the increase of these little insects, and others attribute their abnormal development to a certain amount of moisture. It is very probable that a protracted dry spell, if not accompanied by excessive dust, is favorable to the development of a large number of species, and that violent rains at intervals, specially if they occur before the foliage is curled by the work of the pests, is very destructive to these little creatures. On the other hand, it is quite possible that a certain amount of moisture is desirable, and that the reports of certain persons, who have noted a coincidence between the appearance of rains and the development of these forms, may be *correct*.

It is undoubtedly true that natural enemies, prominent among which are ladybugs, syrphus flies and lacewing flies, serve as very useful checks on this interesting group of insects. Repeated observations in different countries, and extending over a series of years, have demonstrated that these insects multiply enormously during periods when plant lice are unusually abundant, and though it may require some time for the natural enemies to overtake their hosts, this is bound to occur in course of time.

The attack of 1903 was not only characterized by excessive severity but also by an undue prolongation; and this latter may have been in part due to unusual rains, which were not favorable to the comparatively unsheltered natural enemies and hindered their gaining an ascendancy over their hosts. The explanation for this is that the plant lice, before the appearance of the rains, had ample opportunity to curl the leaves and therefore provide themselves with shelter from almost any inclement weather. These retreats afforded admirable breeding places from which the insects could emerge and attack adjacent foliage, so that the usual destructive influence of showers would be modified to a considerable extent; on the other hand, the larger predaceous enemies would hardly reap an equal benefit from this protection, and consequently would be delayed in gaining the ascendancy.

Appletree plant lice (*Aphis mali* Linn. and others). These species commonly occur in greater or less numbers throughout the orchards of the State, and their abnormal increase depends on favorable climatic or other conditions. Such was characteristic of the spring and early summer of 1903, and as a result injuries by these species were not only much more marked than usual but also prolonged to a much later date. The worst affected trees, which were usually young, presented a very characteristic appearance, and the injury was so severe that very little growth was possible. Such a large amount of honeydew was excreted that the foliage was almost entirely blackened, and an examination of many trees showed that the growing tips were literally covered by hungry plant lice anxious to reach a tender spot. The severity of the attack began to be evident about the last of May, and was more so in June, continuing in July, and in

some cases at least the plant lice were extremely abundant even to the middle of August. The worse infested trees lost a considerable portion of their foliage; the development of the fruit was severely checked in some instances and many trees were seriously injured. Complaints were received from a number of correspondents in different sections of the State, and almost every observer agreed in holding plant lice responsible for severe damage. Some quince bushes in Genesee county were reported by Mr J. F. Rose as bearing a mass of black, rolled leaves the latter part of June, and the observer in Dutchess county characterized the attack as being more severe than had been known for 10 years. The conditions in the nursery were no better than in the orchard, and a correspondent reports that plant lice obliged him to keep a gang of 15 or 20 men and boys at work continuously in the nursery with a whale oil soap solution, and some other nursery-men found themselves almost unable to cope with the insects, so severe and general was the injury.

Plant lice, as is well known, must be controlled by the use of contact insecticides, the most valuable of which for present purposes are a whale oil soap solution, tobacco water and kerosene emulsion. Some growers prefer the tobacco solution to any other and attribute greater effectiveness to it, while others have obtained excellent results with a whale oil soap solution. The latter, in the case of the appletree plant louse, should be used at a strength of 1 pound to 6 gallons of water, or even 1 to 4, and in any case great care should be exercised to secure thorough treatment. The kerosene emulsion may be used in the same way as the whale oil soap solution, and in case of severe attacks the standard emulsion may be diluted with but 6 or 7 parts of water, since it is better to scorch the foliage a little than to allow many of the insects to escape.

The severe and protracted injuries by plant lice led us to experiment with whale oil soap solution, 1 pound to 4 gallons, for the purpose of testing its effectiveness on the pest and also the liability of injuring the foliage. Apple twigs covered with the insects were dipped into the solution July 28, and on the 30th it

was found that all were killed, while repeated observations up to Sep. 8 failed to reveal any injury to the leaves. We are, however, inclined to believe that it is more important to make a very thorough application than to use a strong insecticide, and would therefore emphasize the former most strongly.

Cherry plant louse (*Myzus cerasi* Fabr.). This common species is likewise generally distributed throughout the State, and always occurs in greater or less numbers on cherrytrees. The past season has been marked by an excessive abundance of this insect, and in some cases sweet cherrytrees have been very seriously injured. We recall, for example, certain trees in Chautauqua county, which were so badly infested, that nearly one third of the leaf-bearing portion of twigs had the foliage so badly affected that it curled, died and dropped, and after a time new leaves were developed in their place. This injury was so great that one or two trees died, probably as an indirect result of the severe drain made on their vitality. The presence of these plant lice in large numbers began to be apparent the middle of May and continued through June and even into early July. Reports of injuries were received from a number of counties in widely separated sections of the State, and were also observed by us in various localities.

Thorough spraying, as in the case of other species, is the only method of controlling this insect, and when applications are necessary they should be timely so that the insects can not curl leaves and thus obtain shelter from the spray.

Cabbage aphid (*Aphis brassicae* Linn.). This species is usually present in small numbers on various cruciferous plants, and only occasionally does it attract much attention on account of its abnormal abundance and consequent injury. Mr J. F. Rose of South Byron states that about the middle of August it was so abundant on early cabbages as to give them a white appearance, and Mr George S. Graves of Newport, Herkimer co., reports it as being numerous on turnips in early August. This species was observed by us in very large numbers on rape at Kinderhook the early part of the season. The insects were so abundant as to

give a whitish color to portions of the plant and rendered walking through the field extremely disagreeable.

Chaitophorus aceris. The Norway maple has enjoyed up to recent years comparative immunity from insect pests, and it was therefore a serious disappointment to its admirers when this species of plant louse injured it so seriously in the last two or three years. The damage by this species has gradually increased, and whereas in 1900 or thereabouts many of the trees had their foliage somewhat disfigured by the sooty fungus growing in the honeydew and drops of this sticky substance occasionally fell on passersby or moistened the sidewalk beneath, in 1903 some of these unfortunate trees had their foliage almost ruined by this pest. Many of the leaves were so badly curled that they presented only about one fourth of the usual surface, and this maple instead of being an object of beauty, was a monument of misery and an eyesore on the landscape. This was true not only about Albany but in various sections of the State. This plant louse can be controlled by thoroughly spraying with a contact insecticide, such as whale oil soap, taking special pains to hit the insects on the undersurface of the leaves, and it looks as though some such treatment would have to be adopted in coming years if we are to keep this shade tree in good condition. This species was the cause of more complaint and incidentally gave more employment to parties operating a spraying outfit in Troy, than even the notorious elm leaf beetle (*Galerucella luteola* Müll.).

Elm aphid (*Callipterus ulmifolii* Mon.). This delicate species occurs somewhat generally on our American elms, and occasionally becomes exceedingly injurious, as was demonstrated in 1897 and again in 1903. This little plant louse was so abundant on many trees during the past summer that the foliage became badly smeared by the honeydew, lost its color and all but failed to perform its proper functions. This condition was somewhat general in the vicinity of Albany, at Palatine Bridge in the Mohawk valley, and a similar state of affairs was reported from Ogdensburg, St Lawrence co. The most of the

damage appears to be inflicted in the latter part of June and during July.

Drepanosiphum acerifolii Thos. This delicate and really beautiful species when examined under a magnifying glass, is capable of causing considerable injury to various species of maple. Its work on hard maple was observed by us last July at Nassau, where it evidently caused considerable dropping of the foliage, and the young were to be found here and there along the veins on the underside of the leaves. Nearly full grown specimens are remarkable for being incrustated with a whitish secretion which nearly covers them. This species was met with by us in considerable numbers on maples at Saratoga, where it has likewise caused some dropping of the leaves and injured the foliage to a considerable extent. It was also reported by Mr George S. Graves, as being on several varieties of maple at Newport, Herkimer co., where it caused much dropping of foliage, and it was observed by Mr Young in small numbers at Poughkeepsie.

Box elder plant louse (*Chaitophorus negundinis* Thos.). A number of specimens of what we believe to be this species, was submitted for examination by Mr George S. Graves of Newport, Herkimer co., who stated that it was exceedingly abundant and destructive to box elder or ash-leaved maples in that vicinity. The attack was first observed in early June and continued till September, possibly later. It is probably the same species which we observed at work in large numbers the latter part of September on some box eldertrees at Nassau.

Beechtree blight (*Pemphigus imbricator* Fitch). This plant louse was exceedingly abundant on some beechtrees at Newport N. Y. Our correspondent, Mr George S. Graves, sent examples under date of Oct. 29, and from the appearance of the twigs we judge that the insect was present in enormous numbers, and had the attack been earlier in the season, it would undoubtedly have caused considerable injury. Mr Graves observed the habit of this species of clustering on the underside of the twigs, and adds that moderately cold weather does not seem to affect them, since an inch of snow was seen on the hillside

only a short distance away, and the temperature during the preceding two days had been quite cold.

Wooly beech aphid (*Phyllaphis fagi* Linn.). This insect has been unusually numerous on purple beech foliage in Washington park, where it was found in very large numbers, July 4. Its depredations on the same tree in Westchester county have also been brought to our attention.

Birch aphid (*Callipterus betulaecolens* Mon.). This little species is particularly injurious to the cut-leaved birch, and is occasionally very abundant. It was reported as being quite destructive at Newport, Herkimer co., by Mr George S. Graves, and evidences of its work were found by Mr Young at Poughkeepsie in the middle of July. The latter trees showed very plainly that the insect had been exceedingly abundant, since the foliage was badly discolored and well smeared with honeydew. We also observed the work of this insect in the vicinity of Albany, and specimens of very badly infested twigs were submitted for examination by Mr E. P. Van Ness of East Greenbush. In this instance, as in the preceding, the attack was a very severe one and the tree had undoubtedly suffered greatly throughout July, if not earlier in the season. Some of the leaves bore a number of pupae of the two spotted ladybug, *Adalia bipunctata* Linn., which had evidently fed on the plant lice, and reduced their numbers very largely.

Pemphigus popularis Fitch. This species is rarely brought to notice, though a few infested leaves of the balm of Gilead, *Populus balsamifera*, were received from Lake Clear Junction through Mr C. R. Pettis. The leaves were drawn together and had much waxy matter on their surfaces, giving them the appearance of having been coated with a whitish powder. In some instances the insects formed a series of pseudogalls on the upper side of the leaves. The cavity produced by drawing the leaf together contained numerous winged plant lice, a few nymphs and many cast skins. Mr Pettis states that all the trees in the vicinity were affected by this species. Another poplar-infesting species, *Chaitophorus populicola* Thos., was met with in considerable numbers on the common aspen at Karner, July 24.

Fruit tree insects

Plum curculio (*Conotrachelus nenuphar* Herbst). This little enemy of stone fruits is prevalent to a greater or less extent in most orchards of this State, and occasionally causes considerable injury. It is remarkable for existing in some localities in such small numbers as to cause practically no damage, while in others a large proportion of the crop would be ruined unless collecting or other repressive measures were employed. Recent experiences by several growers in the State, go far toward showing that thorough and early spraying of the foliage with an arsenical poison affords considerable protection from this pest. This method is preferred by many to the more laborious one of collecting the beetles and is certainly worthy of further trial.

Diplotaxis liberta Germ. This species is rarely brought to notice on account of its depredations and the same is true of its allies. A complaint was received Sep. 24 through the commissioner of agriculture from Mr John R. Crandall of Hauppauge, who stated that this beetle had stripped all the foliage from many young peachtrees in an orchard of about 30 acres. He added that they worked at night, burying themselves in the dirt under the trees during the day, and that anywhere from 10 to 50 were found under each tree, apparently preferring Elbertas. The beetles occurred nowhere except in the peach orchard. This insect is closely related to our common May or June beetles and presumably has similar habits, the larvae probably living on grass roots and undoubtedly thriving best in light, sandy soils. Reference to literature shows that another species, *D. frondicola* Blanch., was recorded in 1871¹ as being very injurious in June to leaves of rose, mountain ash and wild plum in an Iowa nursery. They were about nearly a month, feeding only at night, and were considered one of the worst pests of that year. An attack similar to the one we have recorded occurred in the spring of 1888,² at Herndon Va. in a young orchard which had been mostly planted the preceding year. The 12-spotted *Diabrotica*, *Diabrotica 12-punctata*, was the principal depredator, though a species

¹Kridelbaugh. Ia. State Hort. Soc. Rep't 1871. 1872. p.161.

²Riley-Howard. Insect Life, 1:59.

of *Diplotaxis* was also present in small numbers. The plums and apricots near an old melon patch where the *Diabrotica* had bred were soon stripped of foliage and the insects spread over nearly the entire orchard. Another species of the same genus, *D. harperi* Blanch., was reported May 24, 1894,¹ as injuring strawberry plants at Campbellsburg Ind. The account states that they attacked the smaller and weaker plants on a $2\frac{1}{2}$ acre field and very quickly destroyed them. As many as 20 beetles or over were found at a time on a single plant. The insects appeared first in some wheat and when that became too tough migrated to the recently set strawberry field. The soil was a light, clayey loam and paris green was applied but without benefit.

These little scarabaeids are difficult insects to control and in a general way may be classed in this respect with the closely related and well known May or June beetles, *Lachnosterna*, and rose beetles, *Macrodactylus subspinosus* Fabr. Anything that tends to make the foliage distasteful to the insects, such as dusting with air-slacked lime, wood ashes, etc. has some protective value, but comparatively little benefit results from spraying with an arsenical poison. It is possible that collecting the insects by jarring into a curculio catcher might prove of some value. This would have to be done in the evening when the beetles are on the trees, and in all probability it would require considerable shaking to dislodge them. The injury to the foliage late in the fall is of comparatively little importance compared with depredations in the spring, and apparently there is a prospect of this species causing some injury at that time, in which event it would pay to go to considerable expense in collecting the beetles or employing some other means to destroy them, so as to prevent severe injury to the trees by the destruction of fruit and leaf buds early in the season.

Appletree tent caterpillar (*Malacosoma americana* Fabr.). This insect is more or less injurious each year, and during the present season has not been very destructive, though somewhat abundant in various localities, specially where no effort has been made to control it. The injury, as a rule, has been less than

¹Davis. Insect Life, 7:199

in the last two or three years, except in Cattaraugus county, where this species is reported as having increased very largely in the last two or three years.

Codling moth (*Carpocapsa pomonella* Linn.). It is well known that the larvae of this insect pass the winter in considerable numbers under the sheltering bark of trees, and that they gnaw pupal cavities in the outer dead bark. Our attention was recently called to a somewhat anomalous situation and an examination showed that a small tree had been badly injured by borers in preceding years and that codling moth larvae, descending the tree in the fall, had entered the galleries made by the borers and in excavating pupal cavities had not refrained from eating into living tissue where they caused considerable bleeding and at first sight lead one to suspect that the injury was due to the round-headed borer. The tree in question has a trunk about 6 inches in diameter and some 12 or 15 larvae were taken from several of the cavities. Three or four of the caterpillars were found contiguous to living tissue which had been recently eaten and from which considerable sap was flowing. The borings were conspicuous and many of the pellets were saturated with exuding sap.

Pear Psylla (*Psylla pyricola* Forst.). The season of 1903 has been remarkable for the unusual development of plant lice, and this little jumping species is no exception to the general rule. It has been exceedingly abundant and destructive over a considerable portion of the State, and peartrees with blackened, scanty foliage or almost none at all, were common sights during the summer not only in the Hudson river valley but also in central and western New York. The injury was much more general and severe than has been observed before, and the explanation therefor is probably found in the unusually favorable climatic conditions. Evidences of great damage began to appear in June, and during July and August the affected trees presented a truly wretched sight. In some cases the injury was so severe that most of the fruit dropped. Mr H. D. Lewis of Annandale reports the crop of that section a failure, due to the work of this pest.

Early and thorough spraying with a whale oil soap solution, 1 pound to 4 gallons, has been found thoroughly effective in the hands of Mr Albert Wood of Carleton Station, who states that he has succeeded in keeping the insect well in subjection by this means. Thorough work in the early part of the season will do much toward preventing subsequent injuries, and if the necessity arises of repeating applications, much better results will be obtained if the work is done just after a rain, which serves the useful purpose of washing away the honeydew and therefore exposing the growing insects to the deleterious action of the insecticide.

San José scale (*Aspidiotus perniciosus* Comst.). This pernicious insect has become so abundant in some orchards in the State that its control is a serious problem, and anything bearing on its habits and disseminative powers is of interest. The latter part of the summer was marked by the development of very large numbers of insects, the breeding being so rapid that in some places the bark of entire trees was covered.

The rapidity of its spread in a locality is of great importance, and is undoubtedly influenced by a number of factors. In the first place, there is no doubt that the spread is much more rapid where the pest is allowed to breed unrestricted than in localities where such is not the case; for example, the scale has been in the large orchard of Mr W. H. Hart of Poughkeepsie for 13 years, and yet it has failed to spread to any great extent, portions being practically free from it even after the lapse of years. A close examination of the center of infestation existing at Clinton Heights shows that while the insect has been present there for about the same time there has been no extensive spread. The primary point of infestation is a little to one side of the center of an isosceles triangle, which has an altitude of $\frac{3}{4}$ mile. This is bordered on one side by a public highway and on the other by a trolley line. Several contiguous orchards lie within this area, and the pest has gradually made its way from one to the other, though the spread has by no means been rapid. Aside from the point of original infestation, the injury to the trees has not been very marked, in fact, the spread through these small orchards

has been so slow that those in the point of the triangle, less than half a mile from the original infestation, are still free from the pest. An examination of orchards just across the highway from near this center, failed to reveal any scale. It should be stated in explanation, that while the insect was allowed to breed in considerable numbers from about 1897 to 1899, since then earnest efforts have been made to keep it in check, and as a general thing, it has been controlled in a fairly satisfactory manner. It is true that there is one point of infestation a half mile southwest of the source of trouble, but investigation shows that in all probability the scale became established there by being carried on infested trees which were set in that vicinity.

Investigations and inquiries in a peach-growing section, where the scale had become established in a few places 3 or 4 years ago, reveals the fact that the pest has already obtained a foothold in some orchards from $\frac{1}{2}$ mile to 2 miles or thereabouts from others, and in this instance we are inclined to believe that these colonies established at a distance are due to the fact that no very adequate control of the insect has been maintained. It may also possibly be explained in part by the fact that young scales are fully as likely to crawl on peach foliage as on that of other fruit trees, and it would therefore stand a better chance of being conveyed by insects or birds.

New York plum scale (*Eulecanium juglandis* Bouché). This species is well known as a very destructive form to plumtrees in western New York, where it has at times been exceedingly injurious. Our attention was called in August to a plumtree at Kinderhook N. Y., which had the undersides of its branches literally covered with full grown scale insects and a great many young were found beside the parents. The tree itself had suffered serious injury though there were no signs of any numbers of the pest on those adjacent. This insect, as is well known, can be readily controlled by spraying in the fall or early spring with a contact insecticide, such as kerosene emulsion or whale oil soap solution, and we see no reason why the lime-sulfur wash, if it is to be employed in the orchard, would not be as effica-

cious in killing this species as it is in the destruction of the San José scale.

Plum mite (*Phytoptus phlaeocoptes* Nal.). The presence of this little mite on plumbrees at Marlborough, was brought to our attention some years ago, and an examination the present season shows that it exists in the locality only in very small numbers, and as a consequence is hardly likely to become a pest of any importance. The owner has cut down the original tree and anticipates very little trouble in the future.

Grapevine pests

Grapevine sawfly (*Blennocampa pygmaea* Harr.). The larvae of this species were met with rather plentifully July 28 in the vineyard of Mr W. H. Van Benschoten, West Park N. Y. Tips of shoots, here and there, were partially defoliated, but in no instance was material injury caused. The larvae are usually rare in New York State vineyards, so far as our observations go, and in case of their appearing in very large numbers, they should be controlled by thorough spraying with an arsenical poison.

Steely flea beetle (*Haltica chalybea* Ill.). This pernicious Chrysomelid is well known to grape growers, and in some vineyards in the Chautauqua region it has caused considerable injury year after year; particularly is this the case with certain vineyards located well up on the hill and back from the lake. The greatest damage is done by the beetles feeding on the unfolding buds, and the best method of checking the injury is undoubtedly by very thorough spraying or even painting the unfolding foliage with a strong arsenical mixture, particularly paris green or london purple, because these substances act more quickly than does arsenate of lead.

Grapeberry moth (*Polychrosis botrana* Schiff.). This insect was not only destructive in Chautauqua county but developed in such large numbers in some Ohio vineyards as to destroy one third of the crop as reported by Mr T. S. Clymonts. Our experiments have shown that one thorough spraying with an arsenical poison, preferably arsenate of lead, just after blossom-

ing, will result in severely checking this pest [see New York State Museum Bulletin 72].

Garden insects

Asparagus beetle (*Crioceris asparagi* Linn.). The common asparagus beetle as recorded in our 15th report, page 540, has attained a wide distribution over the State, though our records limit it almost entirely to the lower Hudson and Mohawk river valleys and the western portion of the State in the vicinity of the lakes. We were therefore somewhat surprised to receive a communication from Mr C. L. Williams of Glens Falls, Warren co., accompanied by specimens, stating that this species had become well established in that vicinity and was known to occur in some numbers over an area several miles in extent. This is the northernmost locality known to us, for the species in New York.

Cabbage maggot (*Phorbia brassicae* Bouché). This little pest of the market gardener was unusually abundant and destructive this season. Its depredations on early cabbages attracted considerable attention in Genesee county, it was credited with having destroyed one fourth of the crop in St Lawrence county, and with working to some extent in Cattaraugus county and other sections of the State. The life history of this little pest may be summarized briefly as follows: the adult insects appear in the early spring, the precise time depending somewhat on climatic and other conditions. They are, however, usually abroad in time to deposit eggs around early set plants, finding some crevice in which they may creep and place their eggs close to the stem. These remain unhatched for a period variously stated as from 4 to 10 days when the young grubs issue, attack the surface of the root and rasp a burrow into its tissues. They destroy first the smaller rootlets and then begin operations on the main root. They are frequently found in slimy burrows just beneath the surface of the stem. There are usually so many maggots that all are unable to find retreats within the tissues, and consequently many of them lie near the surface, which is kept moist by the juices from the injured parts. The wilting of the plant is the most

characteristic indication of injury and on pulling it up, the remains of the roots and the whitish, slimy maggots are easily observed.

One of the best methods for protecting cabbage plants from this insect is to surround them with a tarred paper collar about $2\frac{1}{2}$ inches in diameter, which is so cut as to practically encircle the stem. These are readily adjusted about the plant, easily cut and form one of the most efficient methods of preventing the parent fly from depositing its eggs.

A carbolic soap emulsion composed of 1 pound of hard soap dissolved in a gallon of water, in which 1 pint of crude carbolic acid is then poured, emulsified and diluted with 30 parts of water, is very efficient in killing the maggots about infested plants. An application should be made shortly after the plants are set out, and repeated once a week or 10 days till after the middle of May. The standard kerosene emulsion diluted with 12 to 15 parts of water has also proved very successful. Either may be readily applied with a knapsack pump. It is possible to check the attack, where labor is cheap by removing the earth from the affected parts in the morning of a bright day and replacing it at night. The drying kills the maggots without injury to the plants. This is practised to some extent on Long Island, as stated by Mr F. A. Sirrine.

Onion maggot (*Phorbia ceparum* Meigen). This serious pest of market gardeners has, like its close ally, the cabbage maggot, been very injurious in portions of the State, particularly in St Lawrence county where it is credited with having destroyed one fourth of the onion crop. It has also caused considerable complaint in the vicinity of Albany.

This insect, so far as known, has a life history very similar to that of the cabbage maggot, and may be controlled in like manner, except that it is impracticable to use the tarred paper collars though the carbolic soap wash can be employed to very good advantage.

Tarnished plant bug (*Lygus pratensis* Linn.). This notorious and almost ubiquitous pest occurs on a great many

plants and causes more or less injury from year to year. Last July our attention was again called to it on account of its sucking the juices from tender aster shoots and thereby killing them. Mr Egbert Blauvelt of Coeyman, who made the complaint, states that the insects can be killed by thoroughly spraying with a whale oil soap solution, using 1 pound to 9 gallons of water. Clean culture, not only in the garden but in adjacent fields, will do considerable toward reducing the numbers of this pest.

Grain and house pests

Saw-toothed grain beetle (*Silvanus surinamensis* Linn.). This little grain beetle is a common species in prepared foods and various grains and though occasionally very abundant, it does not as a rule cause much annoyance in this country. This species was found last August literally overrunning a dwelling house in Albany. The beetles were so numerous that they made their way into everything and the housekeeper could sweep up nearly a pint almost every warm day. They were found in all parts of the dwelling, resting on ceilings, crawling on walls, under mats, tablecloths etc. and even invaded wearing apparel, articles of food, etc. Investigation showed that the source of the trouble was several thousand bushels of oats in the bin of a near-by brewery. The insects were breeding there very rapidly and on warm days appeared in large numbers and invaded near-by dwellings. The best remedy for such an outbreak is fumigation of the grain with carbon bisulfid and similar treatment of the dwelling houses or better still fumigating them with hydrocyanic acid gas. This latter, however, is a very dangerous poison and must be handled with extreme care.

Fleas. The cat and dog flea (*Ceratopsyllus serraticeps* Gerv.) is a well known pest of domestic animals, and in the public mind is associated only with these animals. There are a number of records of this species propagating to a marvelous extent in houses closed for the summer, and the occupants on opening them in the fall would find their premises literally overrun by these annoying, active and most hardy pests. This has

been the experience of several Albanians in the past summer, and the most practical way of ridding the house of these vermin is by thorough fumigation with hydrocyanic acid gas, using 1 fluid ounce of sulfuric acid diluted with 2 fluid ounces of water and 1 ounce of high grade (98%) cyanid of potassium for every 100 cubic feet of space. A preliminary fumigation using half the above amounts and continuing the treatment two hours killed practically all the Psocids in the house and many fleas, while the usual amounts with a six hour fumigation destroyed all the fleas. The acid and cyanid are among our most deadly and virulent poisons and the same is true of the generated gas. Before treating, the house should be first carefully examined and every orifice or crack which would allow the egress of air should be carefully stopped. All fluids and liquid foods should be removed from the house and arrangements made so that the building can be opened from the outside after fumigation. The gas is generated by dropping the cyanid in large earthenware vessels containing the proper amount of diluted acid. It will be found advisable to have one or two of these jars in each room or hallway, and so arrange matters that the cyanid while still in the bag, can be dropped into one vessel after the other very rapidly, or else with a series of strings, dropped into all of the vessels at once. After the charge is set off the house should be carefully guarded so that no person can enter, and if it be in contact with others in a row, those in adjacent dwellings should also be warned so that the rooms next the treated building may be well aired during the fumigation, which should last from one to several hours. The building should then be thoroughly aired by opening doors and windows from the outside, and utmost pains taken to free the house of gas before any one be allowed to enter. The airing should last at least 30 minutes, and it will be preferable to extend this time to one, two or even three hours, dependent somewhat on the size of the building and the facilities for ventilation. One treatment should be sufficient but in the case of poorly constructed houses a second fumigation may be necessary a week or 10 days later. This dangerous operation should

be attempted only by those fully conversant with the nature of the materials with which they are dealing.

Shade tree and forest insects

Elm leaf beetle (*Galerucella luteola* Müll.). This species has won for itself a very bad reputation in the Hudson river valley on account of its extensive injuries to elms, particularly the European species. It is still extending the area of its operation. Last year it was detected in a limited portion of Saratoga Springs, and this season we were sorry to observe that it had spread over practically the entire village and would have caused material injury to the shade trees had it not been for the systematic and continued spraying conducted by the village authorities. An examination July 16 showed that the grubs were full grown in that locality and that many had pupated. We are inclined to believe that the second brood, if any, would be very limited in that section. This species has also been reported as present in very large numbers at Schuylerville, only a short distance from Saratoga Springs. It has become established over a considerable portion of Schenectady, where it is causing considerable injury and is likely to inflict more in the next year or two unless adequate measures are taken for its suppression. This insect as noted in Museum bulletin 64, has obtained a foothold at Ithaca N. Y. and we are in hopes that it will not be allowed to inflict serious injury on the beautiful trees of that city as it has on those of some others in the State. A detailed account of this species appears in Museum bulletin 57.

White marked tussock moth (*Notolophus leucostigma* Abb. & Sm.). This common enemy of shade trees annually attracts more or less attention on account of its ravages in different cities of the State, in spite of the fact that it is a comparatively easy one to control, not only on account of its eggs being deposited in conspicuous masses which may readily be removed from trees, but also because it is easily destroyed with arsenical poisons. In our preceding report we chronicled the abundance of this insect in Buffalo, and the present season has

been marked by a repetition of the injury, though the attack was not so severe as that of the preceding summer. The causes for this latter condition may be in part due to repressive measures adopted by citizens of that city, but on the whole we are inclined to believe that natural enemies or unfavorable climatic conditions were the most potent factors in reducing the numbers of this pest. The condition of the trees in that city is a most effective argument in favor of establishing a paid forester or other official whose duty it shall be to look after the street trees as well as those in the parks and see that they are adequately protected from insect ravages. This matter is one of increasing importance, as our cities are growing rapidly in size, and as a consequence there is a greater massing of foliage and therefore more favorable conditions for the development of large numbers of a species. It requires but a few years for insects to destroy a tree which may have been from 10 to 50 or more years in growing, and in cities where this is allowed a deterioration of real estate values must follow, accompanied by an increase of various diseases and a higher mortality, because of the rapid and extreme temperature changes due to the absence of trees.

This pest can be easily controlled in either one of two ways. Many of the caterpillars can be jarred or brushed from the infested trees, and their ascent prevented by the use of a band of loose cotton tied around the tree or a band of tar on a piece of stout paper, the latter to prevent injury to the tree. Both of these materials are very effective, and in our judgment vastly superior to the brass bands seen on the trunks of so many shade trees in Buffalo. Bands, however, are of value only in keeping the caterpillars off the trees. The jarring of the pests is somewhat laborious, and as the insects are readily destroyed by spraying with an arsenical poison a prompt application of some such material to the foliage is advisable. Arsenate of lead is one of the best poisons. It may be applied at the rate of 4 pounds to 50 gallons of water. Use this insecticide only in the prepared paste form, diluting to the proper extent, and under no conditions purchase the crystalline article. The older standard

poisons, paris green, london purple and similar preparations are very effective, though subject to washing by rains. These latter substances should be used at the rate of 1 pound to 100 gallons of water, with 1 pound of recently slaked lime to protect the foliage from burning. Spray thoroughly in any event and aim to cover so far as possible every leaf with the poison. Protective measures should be adopted early or the injury will be beyond repair. It is hardly necessary to add that it is impossible to grow magnificent trees if they are defoliated year after year, as unhappily seems to be the case in some cities in recent years.

Fall webworm (*Hyphantria textor* Harr.). This species appeared rather early in the season on various forest and fruit trees in different sections of the State, and in certain localities was somewhat abundant and destructive. Generally speaking it has not caused serious injury except in a few localities where no effort was made to check it. This species, like the two tent caterpillars, is readily controlled by spraying with an arsenical poison, and its conspicuous web nests, which serve as a retreat for the caterpillars, are easily removed from the tree and the inmates destroyed by crushing or burning.

Forest tent caterpillar (*Malacosoma disstria* Hüb.). As noted in our preceding report, Museum bulletin 64, page 104, the ravages of this pest are on the decrease, and the present season has witnessed practically no injury by this insect. A few caterpillars were observed in Rensselaer and Columbia counties but in no instance coming to our notice was a tree even partially defoliated. A lack of reports from other sections of the State indicates a like gratifying condition, and we are in hopes that this outbreak is practically ended and that the species will be comparatively innocuous for a number of years.

Walnut worm (*Datana integerrima* Grote & Rob.). The work of this insect is more or less evident each year, particularly in the western part of the State, and during the past summer our attention has been called to its ravages in Herkimer county, and we have observed a number of black walnut trees in Chautauqua county which have been from one half to two thirds or entirely defoliated by this caterpillar.

Beneficial insects

Chinese lady beetles (*Chilocorus similis* Rossi). The specimens obtained from the United States Department of Agriculture through the kindness of Dr L. O. Howard, and liberated in East Greenbush in August 1902 failed to survive the winter. A second shipment of 25 was received Aug. 13, 1903, again through the generosity of Dr Howard. These specimens were set at liberty at Kinderhook N. Y. on the estate of Mr L. L. Morrell, who is a large fruit grower. The tree selected was a large appletree badly infested with San José scale, near the barn and on the edge of the old orchard, close to his young pear orchard. There is an abundance of scale on the old trees, as well as on the young, and Mr Morrell has consented to refrain from treating these, in order to give the imported beetles an opportunity to demonstrate their value.

An examination Sep. 23, 1903, of the appletree where these insects were placed last August showed that eggs had been laid and a number of young were easily found. Four adult beetles, probably descendants of those originally established and nearly 20 larvae of varying size, from very young to nearly full grown, were found in the center of the tree. This is a quite large one and is very badly infested with the scale and there is every probability that there are many more ladybugs on it and near-by trees than were discovered, though a brief search failed to reveal any on the latter. The examination was purposely limited because of the difficulty of detecting the insects and the danger of crushing them in crawling about on the limbs. It certainly looks as though this introduction had been fully as successful as that of the preceding year and it is most earnestly hoped that some will survive the winter, in which event we may be able to demonstrate the utility of this insect in our climate.

Little black lady beetle (*Pentilia misella* Lec.). This little lady beetle is usually found toward the end of the season in orchards infested with San José scale, and we have on several occasions recorded its presence in some numbers. Anything relating to the abundance and effectiveness of predaceous insects is of *interest, and it is gratifying to state that in October we found this*

little species, far more abundant than we had observed it before, in a badly infested peach orchard in Orange county. The little beetles were so numerous that 20 or 25 could easily be counted on a small portion of the trunk of a peachtree, and undoubtedly some of them bore from one to several hundred of these little lady beetles. They were crawling actively over the infested tree and evidently looking here and there for insects suitable for their needs. It is a source of regret to state that in spite of the great abundance of these little lady beetles, there appears to be no very material diminution in the numbers of the scale insects, which literally swarmed on many of the trees. The worse infested ones were more attractive to the lady beetles than the others. We have yet to meet evidence showing that this species is very efficient in reducing the numbers of this scale insect.

EXPERIMENTAL WORK AGAINST SAN JOSÉ SCALE INSECT

The control of this pernicious insect is a problem of considerable importance in localities where it has become established. This work was begun by us in 1900, primarily for the purpose of testing the effectiveness and possibilities of crude oil applications. Our results show that a mechanical emulsion of this material can be used, and if great caution is exercised in its application, comparatively little or no injury follows. So many, however, have met with such ill success that we have also experimented to a considerable extent with other materials, specially since in the last year or two we have observed some evidences of injury to the bark after the application of oil. This first appears as an enlargement of the lenticels, which is evidently followed by a great increase in thickness and a very rough, unsatisfactory condition of the bark, and this has led us to question the advisability of continuing such applications year after year, and also to make further tests of materials which were free from this objection.

Early spring or winter applications

20% mechanical crude petroleum emulsion. The work with this insecticide was continued the present season in the experimental orchard, the application being made Mar. 3, to about 70 trees

representing a number of the more common varieties. It will be observed that the spraying was earlier than usual, and the weather conditions favorable, the day being dry with only a moderate amount of wind. This insecticide was applied as in the spring of 1902, to the following trees: numbers 15-28, 34-47, 60-74, 79-91 and 101-14; or in other words, to the western end of the experimental orchard, a map of which was published in our report for 1900. The general character of the trees and their varieties have been previously published, and may be ascertained by referring to the above publication. Tests of the mechanical dilution were made while the work was in progress with the following results: at tree 18 slightly less than 20%; at tree 39, 26%; at trees 45 and 46, 31%; at tree 84 slightly less than 20%, and at tree 101, 33% of oil. The above figures represent more variation than is desirable, and yet, so far as we were able to see, the trees suffered very little from the treatment. Inspection a few days after showed that all were well covered with oil, though in some cases where the bark was quite rough, it is probable that there were scales which escaped.

Examination of these trees the latter part of July showed that while a number of them were rather badly infested by living young, a great many were relatively free. The following were rather badly infested: trees 15, 16, 22, 38, 41-44, 73, 79, 82 and 86. The foliage on tree 101 was light in color, small in size and the growth only fair. It looked as though it had suffered some injury, and undoubtedly the petroleum had hurt the bark to some extent. This injury was also noticeable to a lesser extent on some other trees, the most common indication being much enlarged lenticels, which seemed to be followed by an excessive development of outer bark and a corresponding roughness, so that trees in this condition presented a somewhat bad appearance.

A general examination of the experimental orchard Sep. 25, showed that the section sprayed with petroleum emulsion was generally in much better condition than that treated with the lime-sulfur wash. A few of the trees in the petroleum section, notably 23, 41 and 75, were badly infested by numerous living

young which had evidently developed within the last two or three weeks.

The ultimate effect of successive applications of crude petroleum to various fruit trees is of some interest, and on this account we purposely made annual applications to certain trees, and an examination of them is not without interest, since while it shows some injury, the damage is not so serious as it first appeared. For example, tree 101, a seckel pear, was very badly infested in 1900, when it was sprayed with undiluted petroleum and seriously injured. The following year it was treated with a mechanical mixture consisting of 15% oil and a whale oil soap solution, 1 pound to 4 gallons, and in the spring of 1902 and of 1903, with 20% mechanical emulsion. The tree at the outset, as above noted, was in poor condition. It has been steadily improving, and last December had developed a large amount of new wood, and during the present season has made a fair growth, though the foliage is rather light in color and less than normal size. Tree 114, a pear of the same variety, received undiluted crude petroleum in 1900, but was not injured so seriously as 101. Each subsequent year it has been sprayed with a mechanical crude petroleum emulsion and is now in a vigorous condition and in much better state than three years ago, though the roughness of the bark on the trunk is becoming more pronounced. Tree 69, a Howell pear, was sprayed in 1900 with the whale oil soap and petroleum combination, and with mechanical petroleum emulsions the three succeeding springs, and is now in as good condition as others which have not been subjected to annual applications of oil. The same is practically true of tree 66, a Bartlett pear. Other instances might be cited, but enough has been given to show that ordinary fruit trees can stand at least four applications in successive years without much injury. The benefits resulting from this treatment in the vicinity of Albany, as compared with those accruing from the lime-sulfur combinations, were so marked that the owner has repeatedly urged us to apply the oil to the entire orchard, because the lime-sulfur wash had not proved satisfactory in controlling the scale. It is only fair to add that much better results have

been obtained with this latter insectide in some other portions of the State.

Lime-sulfur washes. Early experiments with this material were so unfavorable, that it was supposed to have no value in our eastern climate, though it had been used with great success in California. The matter was revived in later years, and recent tests have shown that under certain conditions, at least, very large proportions of the scale have been killed by the use of this insecticide. Our applications last year were somewhat unfortunate, in view of the fact that we failed to kill a satisfactory proportion of the insects, and in this respect our results were somewhat different from those obtained by other experimenters. The treatment was followed by continued heavy rains, and this, with oil from applications the preceding year may account for the noneffectiveness of the wash. Further experiments were conducted the present season for the purpose of testing the value of the preparation more thoroughly, and also for determining, if possible, the best wash to be employed. The early spring experiments were at Clinton Heights, and at Warwick. Two formulas, in particular, were tested: one which may be known as the 30-30-30 combination to 100 gallons, and the other the 40-15-20 to 60 gallons. Both gave excellent results at Warwick, where conditions were almost ideal for careful experimentation, and a modification possessing some advantages was also employed. This latter consists of 25 pounds of lime, 20 pounds of sulfur to 60 gallons of water. Unfortunately the experiments at Clinton Heights though carefully performed failed to yield the results we desired, partly on account of unfavorable conditions due to very large trees with rough bark being the only ones available. In our experimental orchard at Clinton Heights an application of lime-sulfur, using a 30-30-30 formula, was made to the same trees treated in this way the preceding year, and we regret to state that the results were not very satisfactory, though the application was more successful than that of 1902. The spraying was followed immediately by some snow and rain, and while this may have had a detrimental effect, it does not account entirely for the failure. It is possible that the extremely

rough bark on certain trees sheltered some of the scale insects from the application, and consequently it was only a short time before the trees were restocked by breeding. An interesting series of experiments was conducted at Warwick, the essential details of which are given in the table on page 156. Owing to difficulties in application etc., it was not always possible to regulate closely the period of boiling, and while our intention was to rigidly test the long and the short boil in each formula, as a matter of fact there was some variation as will be seen on consulting the table. The destruction of the scale, however, was all that could be expected, and it is very gratifying to state that Mr W. H. Hart of Poughkeepsie, whose large orchard is infested with this pest, was able by the use of a wash composed of 30 pounds of lime, 20 pounds of sulfur and 15 pounds of salt to 60 gallons of water to keep the insects in subjection in a very satisfactory manner indeed, though some of his trees were of considerable size, being 18 to 20 or more feet high. Mr Hart was careful to have the application made in the most thorough manner and he took pains to always work with the wind when spraying, and in this manner was able to obtain a maximum efficiency with a minimum amount of labor. Comparisons on trees which were sprayed on only one side gave most gratifying testimony to the efficacy of the wash, the treated portions being practically free, while the untreated were almost covered with the pest. Ben Davis seems to be much more susceptible to the scale than the Thompkins County King. Mr Hart is of the opinion that a small amount of rain, particularly a mist for a day or two immediately after spraying, is of value because it brings the caustic wash into more intimate contact with the scale. Mr L. L. Morrell of Kinderhook has also had excellent results from use of a lime-sulfur wash and the same is true of Edward Van Alstyne of the same place.

It is undoubtedly true that considerable variation is allowable without materially influencing the value of the application. A large amount of lime probably has some value because it forms a thicker coat over the branches and is therefore a more efficient mechanical barrier in preventing the establishment of young scale

Warwick experiment, applied March 25-27

Wash	COMPOSITION AND PREPARATION							PROPERTIES				Weather
	Lime	Salt	Sulfur	Resin	Copper sulfate	Water	Boil	Color	Sediment	Adhesiveness	Results	
1	30 lb	30 lb	30 lb	0	0	100 gal.	1 ½ hr	Dark amber	Very little	Good	Very effective, checking breeding	Cloudy with strong wind
2	30 lb	0	30 lb	0	3	100 gal.	1 hr	Dark amber, bluish tinge	Very little	Good	most entirely and probably killing most of the females	Fair, few days following
3	30 lb	0	30 lb	0	0	100 gal.	1 ½ hr	Dark amber	Very little	Good		
4	30 lb	0	30 lb	0	0	100 gal.	½ hr	Light orange	Little	Fair		
5	30 lb	0	30 lb	12 lb	0	100 gal.	45 min.	Dark amber	Some	Very good		
6	40 lb	15 lb	20 lb	0	0	60 gal.	1 hr	Amber	Little	Good		
7	40 lb	15 lb	20 lb	0	0	60 gal.	35 min.	Amber	Little	Good		
8	40 lb	0	20 lb	0	0	60 gal.	1 hr	Amber	Little	Good		
9	40 lb	0	20 lb	0	0	60 gal.	½ hr	Amber	Little	Good		
10	40 lb	0	20 lb	8 lb	0	60 gal.	40 min.	Amber	Much	Good		
11	25 lb	0	20 lb	0	0	60 gal.	2 hr	Amber, greenish tinge	Some	Good		
12	25 lb	0	20 lb.	8 lb	0	60 gal.	1 hr	Amber	Much	Fair		

insects. If too much lime is used it is liable to scale off; consequently there is a limit to the amount which can be employed, and for various practical reasons we are inclined to believe that 25 pounds of lime, 20 pounds of sulfur to 60 gallons of water is a very good proportion. The lime probably aids materially in holding the sulfur and its sulfids (which latter are undoubtedly among the most valuable constituents of the wash), and thus adds to the efficiency of the insecticide by preventing to some extent leaching of its active ingredients. Our experiments fail to indicate the necessity of prolonged boiling insisted on in so many formulas. In fact, it seems as though active boiling for 30 minutes meets every requirement. A wash prepared in this manner appears to be just as effective as one which has been boiled for a much longer time. Salt increases the specific gravity of the liquid and thus undoubtedly aids in keeping the solids in suspension, but so far as chemical action and insecticidal properties are concerned, it appears to have no value, and the same is true of its effect on the adhesive qualities of the wash. So marked is this that we have omitted it from the composition of the wash because of its very problematic value. We are still of the opinion that climatic conditions have considerable influence on the effectiveness of this insecticide, and believe that it should be applied when the trees are dry or nearly so, and that, in order to obtain satisfactory results, no large amount of rain should fall within three or four days after the spraying. This insecticide gives very good results wherever it can be applied thoroughly and has the advantage of being cheaper than any other winter wash, though it is decidedly more injurious to apparatus and exceedingly disagreeable to apply.

The resin solution [see p. 160 for preparation] was added to several of the washes in hopes that it would materially increase their adhesiveness and likewise their insecticidal properties, because such seemed to be the case in some preliminary indoor experiments. Field tests, however, failed to indicate any great advantage resulting from the addition of this material, except perhaps in the case of rains immediately following the applica-

tion. It affected the washes by making them more or less flaky, increasing the amount of sediment, and if much more had been added it would probably have seriously affected the operation of the pump. This material, if used, must be thoroughly diluted with warm water before being added to a cooler lime-sulfur wash, or it is likely to give trouble by gumming up the apparatus.

Summary. Our experience and experimental work may be summarized briefly, as follows:

A mechanical 20% crude petroleum emulsion is a very effective insecticide, and if the pump can be relied on to deliver a constant proportion, there is very little danger of much injury from several annual early spring applications. There is, however, some doubt as to the ultimate result, and the continued use of this material causes increased thickness and roughness of the bark, if no other injury.

Early spring applications of whale oil soap solution, even if only 1½ pounds be used to a gallon, will control the insect in a very satisfactory manner, provided the spraying is thorough. We are by no means certain that this can be done on large trees, particularly those with rough bark.

The lime-sulfur combination is steadily gaining favor in the eastern states, and under certain conditions, at least, is fully as effective in checking the scale as either crude petroleum or a whale oil soap solution. Our experiments lead us to believe that 25 pounds of lime and 20 pounds of sulfur to 60 gallons of water, are equally as effective as larger amounts, and we believe it to be an advantage to have a little more lime than sulfur. We fail to see any beneficial results from the use of salt in this combination, and therefore have omitted it; and in our experience, active boiling for 30 minutes, if the lime is slaked in hot water and the sulfur added at once, gives just as effective a wash as one which has been boiled for one and one half or two hours.

In conclusion, the experience of Mr Hart and other up to date fruit growers, has demonstrated not only the possibility but the practicability of keeping this insect in control in an ordinary commercial orchard. Our observations show beyond doubt, that

this scale insect is a very serious enemy, and unless efficient measures are promptly adopted for its suppression, very great injuries may be caused.

Summer washes

This pernicious insect breeds with such extraordinary rapidity during the summer, that ordinary applications of whale oil soap or kerosene emulsion are not entirely satisfactory, since at the strengths usually employed only the crawling young and smaller scale insects are killed. It frequently occurs that an infestation is discovered in midsummer and the owner wishes to do something at once. The unsatisfactory results with the above named washes led Mr P. L. Husted, nursery inspector of the Department of Agriculture, to experiment with a mechanical 20% crude petroleum emulsion, which was applied in July with a kerowater sprayer to peachtrees. A test of this material was made in a very badly infested orchard in the summer of 1902, and beyond causing some of the foliage to drop where it was the thickest, particularly in places where a 25% emulsion was used, as was the case in certain areas, no serious injury to the trees followed the treatment. The results were so satisfactory that the same course was pursued last summer with equally gratifying effect so far as injuring the trees was concerned, though at the time it did not appear as if the application was effective enough in killing the scale. Subsequent observations, however, have shown that it was more beneficial than at first supposed. In spite of this, we still feel some hesitancy in recommending this treatment in summer, except, perhaps, where the pest is breeding in very large numbers.

This condition of affairs led us to undertake a series of experiments for the purpose of ascertaining if it were possible to make some combination which, while not injuring the foliage, would remain on the trees and be effective for some weeks after application, and at least kill the crawling young as they came from under the protecting scales of the females. The late Professor Lowe conducted some experiments along this line, and our work has been a continuation of that with modifications. It appeared to us as though a lime-sulfur combination, possibly without boiling, could

be made of a proper strength so that it would kill a large proportion of the younger scales, and we were in hopes that it would be powerful enough to destroy individuals emerging from females several weeks after application. The basis of these experiments was a standard wash which we had used the preceding spring with very gratifying results on dormant fruit trees. This wash contained 25 pounds of lime, 20 pounds of sulfur to 60 gallons of water. It was diluted to various strengths, and an effort made to ascertain whether boiling for 15 or 30 minutes had any material effect on the efficiency of the wash. In addition, a resin solution was used, which is prepared as follows: dissolve 3 pounds of sal soda in 3 quarts of water and add thereto 4 pounds of resin and boil till dissolved. While hot, make up to 5 gallons and keep boiling till the resin is well in solution. The resin was added simply to increase the adhesiveness of the wash, in hopes that if this were done the efficiency of the combination would be materially increased. In a few instances the lime-sulfur combination was used with the bordeaux mixture for the purpose of testing the value of this combined wash. The preparation and application of the washes was the work of Assistant C. M. Walker, who is also responsible for many of the field observations. The following table gives in a summarized form the various ingredients of the different washes and their effects on trees and scale and also the conditions under which they are applied. These experiments were conducted in our experimental orchard at Clinton Heights near the western boundary of East Greenbush.

Table of summer washes

COMPOSITION AND PREPARATION										PROPERTIES				Weather
Series	Wash	Lime	Sulfur	Resin	Salt	Water	Boil	Hor- deux	Application	Tree	Adhesive- ness	Effect on foliage	Effect on scale	
1	1	25 lb	20 lb	4 lb	0	240 gal.	0	0	After 2 hr stand	Young apple	Very poor	Uninjured	Kills crawling young only	Applied June 22 fair, with heavy showers on few following days
	2	"	"	"	15 lb	"	0	0	"	"	"	"	"	"
	3	"	"	4 lb	0	980 gal.	15 min.	0	"	"	"	"	"	"
	4	"	"	0	0	"	30 min.	0	"	"	"	"	"	"
	5	"	"	0	0	0	0	50 gal.	"	"	Fair	"	"	"
	6	0	0	0	0	0	0	0	"	"	Good	"	"	"
	7	0	5	1	0	0	0	0	"	"	Good	"	"	"
	8	5 lb	5 lb	0	0	0	15 min.	"	"	"	Fair	"	"	"
	9	"	"	1	0	0	0	"	"	"	Fair	"	"	"
2	1	25 lb	20 lb	4 lb	0	60 gal.	0	0	After 2 hr stand	Young apple	Very poor	Uninjured	Kills crawling young only	Applied July 28, fair, with con- tinuous rains for a number of days following
	2	"	"	"	0	120 gal.	0	0	"	"	"	"	"	"
	3	"	"	"	0	60 gal.	15 min.	0	"	"	Very good	"	"	"
	4	"	"	"	0	120 gal.	"	0	"	"	Very poor	"	"	"
	5	"	"	"	0	240 gal.	"	0	"	"	"	"	"	"
	6	"	"	"	0	490 gal.	"	0	"	Peach	"	Slightly burned	"	"

Table of summer washes (continued)

COMPOSITION AND PREPARATION										PROPERTIES				Weather
Series	Wash	Lime	Sulfur	Resin	Salt	Water	Boil	Hor- deaux	Application	Tree	Adhesive- ness	Effect on foliage	Effect on scale	
3	1	25 lb	20 lb	4 lb	0	60 gal.	0	0	After 2 hr stand	Old apple	Very poor	Slightly burned	No scale present	Applied August 14, fair and days im- mediately fol- lowing. Rain Aug. 16-20
	2	"	"	"	0	120 gal.	0	0	"	"	"	"	"	
	3	"	"	"	0	60 gal. 15 min.	"	0	"	"	Very good	Badly burned, leaves off	"	
	4	"	"	"	0	120 gal.	"	0	"	"	"	Burned, leaves retained	"	
	5	"	"	"	0	240 gal.	"	0	"	Old apple	Very poor	Uninjured	"	
	6	"	"	"	"	480 gal.	"	0	"	Peach	"	Tip slightly burned Uninjured	"	
4	1	25 lb	20 lb	4 lb	0	240 gal. 15 min.	"	0	Imme- diately	Pear	Very good	Slightly burned	75 % killed	Applied August 21, fair and im- mediate days
	2	"	"	"	0	"	30 min.	0	"	Peach	"	Slightly burned	15 % killed	
										Pear		Slightly burned	85 % killed	
										Peach		Slightly burned	40 % killed	

Applied August 14,
fair and days im-
mediately fol-
lowing. Rain
Aug. 16-20

Applied August
21, fair and im-
mediate days

	25 lb	20 lb	4 lb	0	240 gal. 15 min.	0	Imme- diately After 2 hr stand	Old apple	Good	Slightly burned	85 % killed crawling young only	Applied Sep. 4, fair, warm and 3 following days. Heavy rains in October
1	"	"	"	0	"	0	Imme- diately After 2 hr stand	"	"	"	No scale present	
2	"	"	"	0	"	0	Imme- diately After 2 hr stand	Pear	"	"	30 % killed crawling young only	
3	"	"	"	0	30 min.	0	Imme- diately After 2 hr stand	Plum	Fair	Very slightly burned		
4	"	"	"	0	"	0	Imme- diately After 2 hr stand	Pear	Very good	Uninjured		
5	"	"	"	0	480 gal. 15 min.	0	Imme- diately After 2 hr stand	Peach		Ths slightly burned		
6	"	"	"	0	30 min.	0	"					

Series 1. Nine different washes were applied June 22 in this series, and observations made at intervals from June 26 to Sep. 28. Very small amounts were used and the solutions allowed to stand two hours. Different results might have been secured if larger quantities had been employed and applications made at once. The spraying was done with a fine hand atomizer and treatment limited to young, badly infested apple trees which bore all stages of the scale. These trees had been set out only a few weeks and consequently made little growth, though the foliage was in fair condition. The various washes did not injure the leaves, and it will be noted that washes 1 to 5, which were either unboiled or very dilute, adhered poorly, while 6, 7 and 9 containing bordeaux were better in this respect, and 8, which was boiled and also contained bordeaux, was much better. None could be distinguished on the tree 10 days after application. All washes killed the majority of the crawling young but did not prevent the development of established scales or the growth of young appearing after treatment. There was very little appreciable difference in the various washes, and on Sep. 8 all the trees were badly infested by all stages, crawling young being specially abundant.

Series 2. Six washes were applied July 28 in this series, and observations made from July 30 to Sep. 8. The washes were prepared in substantially the same manner as indicated above, and applied to the same lot of trees with the exception of a branch of a peach tree which was sprayed with 6. The condition of the foliage and scale infestation was identical with that in series 1, and the weather conditions were similar. Apple foliage was uninjured by any of the washes, but peach leaves were slightly burned at the tips by wash 6. Washes 3 and 4 were boiled 15 minutes, were more adhesive than the others, and Aug. 10 showed good color but on Sep. 8 no trace remained. The crawling young only were killed.

Series 3. Washes in this series were applied Aug. 14 and were similar to those of series 2. Observations were made from Aug. 17 to Sep. 8, and the conditions, preparation, etc., were practi-

cally the same as in series 1. The applications were confined to portions of old appletrees except in cases of washes 5 and 6, which were also applied to peachtrees. The scale infestation was slight and the weather fair immediately following the treatment. Appletree foliage was injured by wash 3, which caused the leaves to shrivel and fall off, and 4 burned them slightly. Wash 5 burned tips of peach leaves, and 6 had the same effect. Numbers 3 and 4 adhered very well for three weeks.

Series 4. The two washes used in this experiment were applied Aug. 21 and observations made from Aug. 27 to Oct. 20. Relatively large amounts were used and the applications made immediately after preparation. The cyclone nozzle used gave a somewhat coarser spray than the atomizer employed in the first three series. Pear, plum, peach and mulberry trees were used in this experiment and most of them were badly infested. The foliage was in good condition, the weather fair and remained so for a few days following the spraying. Plum and pear leaves were injured by wash 1, particularly in the case of a pear where the treatment was specially thorough. This latter dropped its leaves, while another, which received less of the mixture, did not, though the foliage was evidently injured. Wash 2 seriously injured peach leaves and caused slight burning of plum and mulberry foliage. Wash 1 adhered very well and was present in thick layers Sep. 8 and traces of color could be detected Oct. 20. The same was true to a lesser extent of wash 2. Oct. 20, number 1 had destroyed 75% of the scale on a peartree, and the foliage was slightly burned. A number of limbs were dying on the tree, which had dropped its lower foliage and on which the scale was entirely dead. Only about 15% of the scale had been killed on the living branches. Wash 2 killed 40% of the scale on one tree and about 85% on the other, which latter was in very bad condition.

Series 5. Six washes were applied Sep. 4, and observations made at intervals from Sep. 6 to Oct. 20. Small amounts of the washes were used and the same nozzle was employed as in series 4. Apple foliage was slightly burned by washes 1, 2 and 3,

and pear leaves with wash 4. Plum foliage was injured very slightly by wash 5, and number 6 burned tips of peach leaves to a slight extent but did not injure pear foliage. Washes 1, 2, 3 and 4 adhered well, 5 and 6 more so, 6 in particular being thickly incrusting on limbs and foliage. Wash 1 killed 85% of the scale, and there was a marked contrast between sprayed and unsprayed branches. Wash 2 had no effect on the scale, while 4 killed 30%. The latter was boiled longer and this may account for its greater effectiveness. Variation in intervals between preparation and application appeared to have no effect on the adhesive or insecticidal qualities of these washes.

Summary. A mechanical 20% crude petroleum emulsion was applied in early July, two seasons in succession, to peachtrees without causing much injury beyond dropping some of the foliage where it was the thickest. It undoubtedly destroys a large amount of scale and seriously checks breeding, yet we hesitate to do more than state what it has accomplished. It is perhaps the best thing that can be used where a very bad infestation is discovered in midsummer.

A whale oil soap solution, 1 pound to 8 or 10 gallons; a kerosene emulsion (standard formula diluted with 6 to 10 parts of water), or a 15 or 20% mechanical kerosene emulsion can be used in midsummer for checking the San José scale, but none of these materials can be relied on to kill much more than the crawling young, and breeding is soon almost as bad as before the application unless treatments are frequent.

Our experiments with lime-sulfur combinations for a summer wash have not been as successful as was hoped, though 25 pounds of lime, 20 pounds of sulfur to 240 gallons of water with a 15 minute boil killed a large percentage of the scales on an old appletree in early September without materially injuring the foliage. It is barely possible that a combination of about this strength can be used with beneficial results, but nothing of the kind can be recommended till further experiments have tested its practicability.

DISEASED AND DYING TREES AND INSECT ATTACK

The connection existing between diseased and dying trees and insect depredations is not only one of interest, but also of considerable importance, since in some instances at least serious depredations have origin in a group of diseased or dying trees. It is well known for example that certain species exhibit a decided preference for trees in this condition, and when breeding therefrom in very large numbers are liable to attack healthy trees, if nothing more suitable is within reach. It is very likely for example that the more serious injuries by the elm borer, *Saperda tridentata* Oliv., and the elm snout beetles, *Magdalis armicollis* Say and *M. barbata* Say, begin in this manner. These three insects can at least complete their transformations in dead tissues and are known to work in those which are living, and it seems very likely that in some cases they first attack a sickly limb or tree, and then after becoming abundant are able to kill others which show no signs of lowered vitality. The same is true of certain bark borers belonging to the genus *Tomicus* which operate exclusively in coniferous trees. Our largest species known as the coarse-writing bark beetle, *Tomicus calligraphus* Germ., usually breeds abundantly in diseased bark and instances have come under our observation where this species not only ran a few galleries in living tissues, but evidently took part in a primary attack on a tree in apparently normal condition. It was assisted in this work by a smaller pine bark beetle, *Tomicus pini* Say, which operates in the thinner bark, about the middle portion of the trunk and on the larger limbs. This latter species very likely has more to do in killing trees than the form previously mentioned, but evidence at hand indicates that the larger as well as the smaller may have an important part in this destructive work when conditions are favorable. The destruction of trees by insects breeding from a few dying ones was well illustrated in the summers of 1900 and 1901, at which time a number of pines in the vicinity of Albany began to look unhealthy. Investigation showed that they were infested with bark borers, and later in the season

of 1900 and the following many of the borers emerged from these dying trees and entered others, in which latter they were presumably the prime cause of death. The evidence at hand leads us to believe that in this case the bark beetles were primarily attracted to certain trees because of reduced vitality, possibly as a result of the excessive drouth of the preceding year, and that all subsequent injuries were due to their abnormal abundance; since they issued from the infested trees in swarms and attacked those adjacent, and the insects breeding from the latter in turn invaded others more remote from the center of infestation. The obtaining of data along these lines is somewhat difficult, since it is dependent on favorable conditions, and the following account of observations made during the past season has an important bearing on one aspect of this subject.

Forest fires and insect attack. The annals of entomology contain very little regarding the relationship existing between forest fires and insect attack, and the extended burnings last spring in the Adirondacks, presented a most favorable opportunity for studying this question, so far as fires occurring at that time of year are concerned. The principal object was first to secure data on the rapidity with which insect injury followed fire, and second to learn if there was a connection between extended fires and serious damage by insects in adjacent forests. It is very probable that the time of year when the fire occurs, has considerable bearing on the liability of insects entering the trees and breeding in large numbers, and the same is true of the character of the fire. A forest fire which not only kills but burns trees so badly that there is a rapid drying of those standing is much less likely to be followed by insect attack than one where there is only sufficient burning at the base to kill, specially if death is not rapid. Ap. 30, May 15 and June 3 there were somewhat extensive fires in the vicinity of Big Moose, and investigations by assistant D. B. Young, July 2, showed that insect attacks had become nicely started in the burning of May 15, more advanced in that of April 30, while practically no signs of insect presence were observed in that of June 3. This would seem to indicate that the trees are not at-

tacked till from four to six weeks after the initial injury. Mr Young's investigations showed that trees entirely killed by the fire were less subject to attack than those which had been so severely scorched as to be nearly dead or in a dying condition. An examination July 3 of a large tract at Big Moose, which was burned over June 3 and was extinguished on the 18th, failed to show any insects working on these trees; in fact, within the fire zone they were scarce, only a few common moths and a lady beetle being observed; just outside this fire zone, where trees had been felled to keep the fire from spreading, a few spruce bark beetles, *Polygraphus rufipennis* Kirby had begun to attack the spruce. The trees were attacked in the following order: pine, spruce, tamarack, birch, hemlock, balsam, beech and maple.

Investigations by Mr Young on Aug. 12 of the area burned June 3 showed a remarkable scarcity of bark borers (scolytids) in the fire zone at Big Moose. This may possibly be explained by the fire occurring at a time when no brood of adults was able to take advantage of the favorable conditions, and it may also be that the injured trees were not attractive enough to the insects for some reason or other. In our own experience, we have come across several burnings where it would appear as though bark borers should be abundant, and yet examination has shown them to be present in very small numbers. The timber on the above mentioned area has been injured entirely by large buprestids mentioned in succeeding paragraphs, which cause comparatively little injury to the lumber. The section burned Ap. 30 was also examined, and the principal damage here had evidently been caused by the ambrosia beetles (mentioned in following paragraphs), since they operate in sapwood and produce the black pin holes which seriously affect the commercial value of lumber.

Pine. Investigations July 9 at Lake Clear Junction, where a fire occurred May 18, showed that the pine bark borer, *Tomicus pini* Say, was working in the living tissues of a tree which had been injured by the fire.

The work of this species should be followed soon by that of the sawyer, *Monohammus confusor* Kirby, or *M. scutel-*

latus Say, which begins its operations by depositing eggs in large slits in the bark. The grubs tunnel the inner tissues of the bark and in the course of a short time enter the sapwood and by winter probably pierce the trunk to a considerable depth, materially injuring the lumber for other purposes than firewood. Mr Young's investigations in both July and August disclosed no signs of injury by this species. Two specimens of *Rhyncolus brunneus* Mann. were taken by him July 9 at Lake Clear Junction from a pine injured by fire the previous year.

Spruce. This tree was first attacked by the spruce bark beetle, *Polygraphus rufipennis* Kirby, and the lined ambrosia beetle, *Xyloterus lineatus* Kirby. The former is a very common insect in the Adirondacks and undoubtedly causes a large amount of injury by killing trees, while the latter, working as it does in the sapwood and producing conspicuous black holes, seriously affects the merchantable value of considerable lumber. July 3 almost every spruce in the area burned Ap. 30 at Big Moose was attacked by these two insects, the first working near the top of the tree, while the latter operated in the lower portions of the trunk. Another ambrosia beetle, *Gnathotricus materiarius* Fitch, was also observed in small numbers in the base of one or two trees. On another section, where the fire occurred May 14, it was found that the spruce bark beetle, *Polygraphus rufipennis* Kirby, and the lined ambrosia beetle, *Xyloterus lineatus* Kirby, had just begun work, and a species of *Chrysobothris* was also met with on spruce. Burned areas in the neighborhood of Lake Placid were also visited, and it was found that on the section where a very severe fire occurred April 30, the insects began operations later than on the area burned over about the same time at Big Moose, where the fire was not so injurious to the trees. The fire at Lake Placid, occurring June 3, was less injurious than the one at Big Moose on the same date, and on July 9 the scolytids were just beginning to attack the spruce, indicating that trees which were merely scorched, but not so much as to kill them at once, are sooner attacked by insects.

Investigations of spruce Aug. 12 on the tract at Big Moose which was burned June 3 showed that trees giving no evidence of insect attack on July 3 were infested with the larvae of a buprestid, probably *Chrysobothris scabripennis* Lap. & Gory. This record is of interest as showing when the trees are likely to be infested by this class of borers, which operate largely in the sapwood and do not seriously affect the value of the lumber. This beetle was fairly common on standing but badly burned spruce. The buprestid showed a decided preference for larger trees, though those which were badly scorched so that the inner bark had dried were not infested. Two or three specimens of *Xylotrechus undulatus* Say were taken on spruce, and *Phymatodes dimidiatus* Kirby was also met with in sparing numbers. The bark borers noticed above had made considerable progress.

Tamarack. Investigations July 9 of a section burned May 14 at Lake Clear Junction resulted in finding a tamarack infested by a scolytid, possibly *Tomicus pini* Say. A specimen of *Lep-tura*, *L. subhamata* Rand., was also taken from a burned trunk.

Birch. The yellow birches at Big Moose on the tract burned over Ap. 30 were in early July, in many cases, slightly green at the top and were being mined by *Dryocoetes eich-hoffi* Hopk.; specially was this the case where the trunks were scorched seriously enough to interfere with the circulation of sap. The common flat-headed borer, *Chrysobothris femorata* Fabr., was taken on a fallen birch. The pigeon tremex, *T. columba* Linn., was observed in small numbers on birch, but investigations showed that its attack was confined to more or less decayed trees. This insect was also met with under the same conditions on maple and beech trees. Birch trees were relatively free from insect attack in August, probably because the thin bark permitted rapid evaporation and the consequent drying was unfavorable for borers, though *Dryocoetes* had made considerable progress in the large trees.

Hemlock. The 6-spotted buprestid, *Melanophila ful-voguttata* Harr., was numerous at Big Moose July 3 in the

burning of Ap. 30, on large hemlocks. Though they were somewhat green, none were observed on very small dead trees. A cerambycid, *Xylotrechus undulatus* Say, was observed in some numbers. Examination of these trees Aug. 10 resulted in finding some infested which showed no evidence of insect attack July 3, the larvae of *Melanophila fulvoguttata* Harr. probably being the principal offender. This is perhaps to be explained by this buprestid being on the wing mostly during July, and consequently there would not be a serious infestation till after the adults had flown for a period.

Balsam. Investigations July 2 on an area near Big Moose, burned over Ap. 30 resulted in finding several specimens of *Chrysobothris pusilla* Lap. & Gory on this tree, while *C. scabripennis* Lap. & Gory, were fairly common on the standing but badly burned balsams. Investigations Aug. 12 showed that the balsam compared with spruce was quite exempt from attack, probably due to the thinness of the bark and consequently quick drying of the sapwood. The lined ambrosia beetle, *Xyloterus lineatus* Kirby, was found in small numbers in July and its operations had progressed but little in August.

Poplar. Examinations July 7 of an area near Big Moose burned over May 14 resulted in finding a large species of *Xyleborus* in poplar.

Conclusions. Investigations the present season have shown that, while a number of insects are liable to attack burned trees within four to six weeks after injury, no very material injury is likely to result during the summer, except possibly from the work of ambrosia beetles. The other species either confine their operations so largely to the bark or else occur in such small numbers that for the present they may be neglected. The ambrosia beetles rarely extend their operations to a greater depth than 2 or 3 inches and as a consequence a considerable proportion of the lumber will be free of injury. This would hardly prove to be the case if the trees are allowed to remain standing a second season, at which time they will undoubtedly offer at-

tractive shelters for a number of other borers, some of which may penetrate the wood to a considerable depth and damage it very materially for other than firewood purposes. While prompt cutting of burned timber is advised wherever practical, the evidence at hand is not sufficient to indicate any very urgent necessity of its being removed prior to the winter following the attack. The insects now in the burned trees (if the latter are allowed to remain) will probably appear another spring and be numerous enough to cause considerable damage at least to weaker trees in the vicinity of the burned areas, and their multiplication in such places may eventually lead to a considerable extension of the damage. This is particularly liable to be the case with ever-green trees, and in the vicinity of Albany we have observed several localities where bark borer attack appeared to start with one or more infested trees, and the affected area was gradually increased till a considerable number of pines were destroyed.

It is not only advisable to cut the burned trees so far as possible during the winter, but they should also be removed from the land or at least gotten into water, so that the insects, now under the dead bark will be unable to emerge and continue the attack. The same end may be attained in the case of bark borers, and they are the ones most likely to injure standing trees, by peeling the bark from the logs. This will hardly be practised in this county, even if it were profitable—something requiring demonstration.

VOLUNTARY ENTOMOLOGIC SERVICE OF NEW YORK STATE

The work of the last four years has been continued and a number of valuable observations added to our previous reports. The season of 1902 was unfavorable for the development of certain forms of insect life, and the same has been true to even a more marked extent in 1903. The latter, however, will probably go down in history as a season when plant lice or aphids were abnormally abundant and injurious to a great many plants throughout the entire State. 36 voluntary observers were appointed during

the season and but 21 of them rendered reports. This is largely due to the general scarcity of forms which lend themselves readily to observation, and the depredations of plant lice are so similar that most observers were unable to report on the outbreak in a satisfactory manner. It will be noted that the following reports contain some negative statements, which are of value because they emphasize the abnormal scarcity of various species. Too much dependence can not be placed on these reports, because with some exceptions they may be called local and not representative even of the county. It will also be observed that there are a number of conflicting statements, due to the belief by some parties that dry weather is favorable to the development of plant lice, while others state most clearly that the great increase in numbers of these pests was subsequent to the rains. It may be stated that we have not enough data to explain this difference and we are content at present to give opinions as they are transmitted. The observers all agree in reporting very cold, inclement weather in the early part of the season, and this undoubtedly had considerable effect in checking the appearance or in reducing the destructiveness of some of our more common injurious species.

Albany county [E. T. Schoonmaker, Cedar Hill].—Forest tent caterpillars (*Malacosoma disstria* Hübn.) hatched in limited numbers Ap. 23 and apparently have not suffered by the freeze. These insects caused practically no injury later in the season and consequently no report was made regarding the same. Elm leaf beetles (*Galerucella luteola* Müll.) occurred in limited numbers but were not abundant enough in the country to cause material damage.

Cattaraugus county [C. E. Eldredge, Leon].—Complaint of a looper caterpillar, probably a species of canker worm, was received June 10 with the statement that they had been observed on forest trees in that vicinity for several years, and that previously they had not appeared on apple trees. These insects were so near maturity that on June 17 no specimens were to be found. A soft scale (*Lecanium* ? *pruinatum* Coq.) was taken in some numbers from a trumpet vine. The unusually cold, inclement

weather kept insects well in control, and as a consequence there was comparatively little to report from this section.—*June 10*

Cattaraugus county [F. A. Fitch, Randolph]—Appletree tent caterpillars (*Malacosoma americana* Fabr.) appeared the latter part of April and were very abundant in neglected orchards, increasing immensely in numbers during the last two or three years. Squash bugs (*Anasa tristis* DeGeer) ruined a crop of squashes in this section last year. Cabbage butterflies (*Pieris rapae* Linn.) appeared about the middle of May, and the same was true of May bugs, species unknown, and various mosquitos. The white grub of the May beetle has not been as destructive as in former years.—*May 18*. Potato beetles (*Doryphora 10-lineata* Say), grasshoppers and the plum curculio (*Conotrachelus nenuphar* Herbst.) made their appearance May 26. Early in June curculios were reported as being at work, potato beetles as laying eggs, and plant lice as being present on cherrytrees. The latter are the ordinary black species (*Myzus cerasi* Fabr.) which has been unusually destructive and injurious in various sections of the State. Squash bugs appeared June 18, horn flies (*Haemotobia serrata* Rob. Desv.) the second week in June, and rose beetles (*Macrodactylus subspinosus* Fabr.) were very abundant on some rose bushes. Potato beetles are somewhat abundant and are laying eggs on potatoes. So far this season insects appeared to be less injurious than usual, probably on account of cold rains.—*June 22*. Large, green horsetflies are quite troublesome and young grasshoppers are numerous on lowlands. Insect depredations are less than usual.—*July 8*. There are few mosquitos in the village and on the farm we saw none where commonly there have been millions. Ditching the land has undoubtedly aided very much in reducing their number. Flies are also less abundant than usual.—*July 22*. The first cabbage butterfly was observed in the field Aug. 11. A single mosquito was observed recently, though none had been seen for weeks before. Cabbage maggots (*Phorbia brassicae* Bouché) are working to some extent on cabbage, and the same is true of the cabbage louse

(*Aphis brassicae* Linn.) Grasshoppers are scarce as well as most other injurious insects.—*Aug. 17*

Cayuga county [Purley Minturn, Locke]—Appletree tent caterpillars (*Malacosoma americana* Fabr.) were observed for the first time May 5. Farmers have begun spraying. Very few injurious insects appeared owing probably to the extremely cold and frosty nights.—*May 5*. Colorado potato beetles (*Doryphora 10-lineata* Say) are very plenty, and the small, black flea beetle (*Crepidodera cucumeris* Harr.) is at work on potatoes and also feeding on various weeds in the potato field.—*June 11*

Chemung county [M. H. Beckwith, Elmira]—Cabbage butterflies (*Pieris rapae* Linn.) appeared Ap. 23. The Indian Cetonia (*Euphoria inda* Linn.) was observed May 1, and appletree tent caterpillars (*Malacosoma americana* Fabr.) the 2d. The latter do not appear to be as numerous as usual at this season of the year.—*May 8*. Currant worms (*Pteronous ribesii* Scop.) appeared on gooseberries May 8, asparagus beetles (*Crioceris asparagi* Linn.) May 11 and potato beetles (*Doryphora 10-lineata* Say) were first observed May 16. There were at this time no depredations of special importance.—*May 25*. Plant lice have been very abundant on plum and cherry trees but since the rains they are less numerous. Potato beetles are not very abundant and their eggs are developing slowly.—*June 30*. This has been a most remarkable season for insect depredations, as there have been very few species observed during the protracted dry weather. Early in the summer plant lice were quite abundant on cherry and plum trees and threatened for a time to cause considerable injury, but the wet weather came soon enough to prevent any great damage. Currant worms were less numerous than last year and the second brood was very small. Potato beetles were less destructive than usual and occurred in very small numbers. Cutworms were quite numerous, yet they caused less damage to plants than usual. Tobacco worms (*Phlegethontius 5-maculatus* Hübner.) were very scarce, in fact, only two were met with

this season, though much time was spent in tobacco fields. The striped cucumber beetle (*Diabrotica vittata* Fabr.) and the squash bug (*Anasa tristis* DeGeer) have been so few in number that their attacks were not noticed. The fall webworm (*Hyphantria textor* Harr.) was rather more abundant than last season.—*Oct. 8*

Dutchess county [H. D. Lewis, Annandale]—Appletree tent caterpillars (*Malacosoma americana* Fabr.) were first observed Ap. 20, and forest tent caterpillars (*Malacosoma disstria* Hübn.) on the 30th. A very few bud moth larvae (*Tmetocera ocellana* Schiff.) were observed May 1. Cold weather has kept insects in check and no species is remarkably abundant.—*May 4*. Tent caterpillars are, so far, much less abundant than for the past five years. The weather continues cold and dry and insects and fungi are developing slowly.—*May 12*. Tent caterpillars of both species are reported as causing some injury. Plant lice (*Aphis mali* Fabr. and *Myzus cerasi* Fabr.) are exceedingly abundant on apple and cherry trees respectively.—*May 27*. The latter have appeared recently and they are the only insects which are at all abundant. The weather continues cold and dry.—*June 1*. There is a great decrease in the number of caterpillars from last year and plant lice are exceedingly abundant.—*June 15*. Plant lice are still increasing and are the only insects which are of much importance. Tent caterpillars, both species, are not nearly so abundant as in former years. The weather is very wet at present.—*June 22*. Apple plant lice are present in enormous numbers and more abundant than they have been for 10 years. There are a few cutworms but other insects are scarce. The weather continues cold and very wet.—*June 25*. A very serious attack of pear psylla (*Psylla pyricola* Forst.) has developed within the last 10 days, and the crop will be seriously hurt. Apple aphid is still present in very large numbers, and potato beetles (*Doryphora 10-lineata* Say) are remarkable for their scarcity.—*July 10*. The apple aphid and the pear psylla continued in great abundance and have inflicted very serious damage, specially the latter. The

weather has been very wet and cold since June 1, and apparently favorable for the development of the above insects. The peartrees have suffered extremely, all the young growth being killed, and they are now starting a new growth from next year's buds. This wood can not ripen and the results must be very injurious. We visited one pear orchard of 600 trees where *Psyllas* were still very active and attacking the new growth as fast as it appeared. The pear crop in this section is ruined.—*Aug. 10*

Erie county [J. U. Metz, Swormville]—Striped asparagus beetle (*Crioceris asparagi* Linn.) was observed today for the first time. We have not been able to find any of the spotted species (*C. 12-punctata* Linn.). Quite a little wheat is down but we have not been able to detect any work of the Hessian fly (*Cecidomyia destructor* Say).—*May 28*. Currant worms (*Pteronous ribesii* Scop.) were observed yesterday in numbers for the first time. Rose beetles (*Macrodactylus subspinosus* Fabr.) are exceedingly numerous and causing considerable damage. Both moth larvae (*Metocera ocellana* Schiff.) are quite numerous and causing some injury. Not a trace of Hessian fly has been observed. Many young shoots of blackberries are affected by the gouty gall beetle (*Oberia bimaculata* Oliv.). Potato beetles (*Doryphora 10-lineata* Say) are numerous on early potatoes.—*June 11*. Rose beetles are very numerous and in one instance were so abundant that some cherrytrees were literally covered with them and looked as though they had been scorched by fire; not only the foliage but also the fruit was affected, and the insects were not above eating the grass beneath the trees. Grapevines are also being injured to some extent by these pests.—*July 6*

Genesee county [J. F. Rose, South Byron]—Cabbage butterflies (*Pieris rapae* Linn.) were first observed May 6, and potato beetles (*Doryphora 10-lineata* Say) were first noticed May 7. Tent caterpillars (*Malacosoma americana* Fabr.) are scarce as yet. The extremely cold, inclement weather of early May has kept many insects in check.—*May 11*. Cabbage worms were first observed on plants the 22d. Asparagus

beetles (*Crioceris asparagi* Linn.) are plenty. There are not many potato beetles as yet. Cigar case-bearers (*Coleophora fletcherella* Fern.) are very numerous in some orchards. Something has happened to tent caterpillars, as they are extremely scarce; so evident is this that it is a source of common remark. There are no evidences of injury by cankerworm.—*May 25.* The cabbage root maggot (*Phorbia brassicae* Bouché) is unusually numerous and very destructive to early cabbages. The four-lined leaf bug (*Poecilopsus lineatus* Fabr.) is quite abundant and, as usual, is indifferent as to what kind of plant it attacks, occurring with great impartiality on burdock, peppermint, sage, currant etc. Cankerworms are very scarce in this immediate vicinity, but are reported as having done considerable damage in orchards between here and Rochester. In a trip to Niagara Falls I observed several orchards between LaSalle and that place, which were brown from the work of this pest.—*June 3.* There is practically no Hessian fly (*Cecidomyia destructor* Say) as after inquiry at a grange meeting, only one farmer reported any, and that was in a field of late sown no. 6 white wheat. A similar inquiry regarding cankerworms and tent caterpillars resulted in statements that very few or none had been seen. There is some complaint of plant lice on plum and cherry trees.—*June 15.* The black or cucumber flea beetle (*Crepidodera cucumeris* Harr.) is much complained of and has not only perforated potato leaves but is said to be at work on corn and beans as well as tomatoes. The striped cucumber beetle (*Diabrotica vittata* Fabr.) is very numerous on squash, melon and cucumber vines, nearly destroying them in some gardens. Following our severe drouth we have had three weeks of drizzling rain, and plant lice are very bad on fruit and other trees. We have never seen them on so many varieties of trees till this year. The young growth of quinces for 6 or 8 inches on each shoot is a mass of lice, and the leaves are blackened and rolled up. This plant louse outbreak has been exceedingly severe and injurious to a great many plants. There is a very general complaint among cabbage growers about the root

maggot. The cabbage plant louse (*Aphis brassicae* Fabr.) is also abundant, curling the leaves and turning them blue.—*June 29.* Fall webworms (*Hyphantria textor* Harr.) appeared July 2 and are now quite numerous. The squash bug (*Anasa tristis* DeGeer) has not appeared. There was a fair crop of striped cucumber beetles and they have now disappeared. Cabbages are white with cabbage aphid. This is the first time this insect has been a serious pest in this locality. Plant lice are also exceedingly abundant on fruit trees. Pear psylla (*Psylla pyricola* Forst.) is very abundant and seriously injuring the crop.—*July 2.* Fall webworms are unusually numerous, and potato growers have had little difficulty in controlling the potato beetle. Cabbages are very seriously affected by the aphid. Not a squash bug has been seen.—*Aug. 17*

Greene county [O. Q. Flint, Athens]—No injurious insects have been observed except tent caterpillars (*Malacosoma americana* Fabr.), which appeared later than usual and are much scarcer at this date than has ever been known before. The weather was extremely dry and growers are spraying pear and plum trees.—*May 20*

Herkimer county [George S. Graves, Newport]—Black butterflies (probably *Euphydryas antiopa* Linn.), were observed for the first time Ap. 25, and the same is true of the cabbage butterfly (*Pieris rapae* Linn.). Cold winds and cloudy weather seem to have delayed the appearance of insects.—*Ap. 28.* Webs of the apple-tree tent caterpillar (*Malacosoma americana* Fabr.) began to appear Ap. 30 and were by no means abundant May 6. The weather has been too cold for any rapid increase in insect life.—*May 7.* Plant lice have appeared on wild cherry-trees, and the currant worm (*Pteronotus ribesii* Scop.) is at work, both eggs and larvae being found. No nests of tent caterpillars have been observed this week. The weather is warm and dry.—*May 14.* Potato beetles (*Doryphora 10-lineata* Say) were observed May 16, and currant lice (*Myzus ribis* Fabr.) were just appearing on the leaves on the same date.—*May 21.* Black flea beetles (*Crepid-*

dodera cucumeris Harr.) are appearing on potato leaves, and some insect is feeding quite generally on plantains, (very probably *Dibolia borealis* Chev.). Horn flies (*Hæmatobia serrata* Rob.-Desv.) are quite numerous on cattle. An examination shows that eggs of the currant worm are abundant. Elm foliage is full of holes, probably the work of larvae of the elm flea beetle (*Disonycha triangularis* Say).—*May 27*. Terminal leaves of elms are badly twisted and wrinkled by aphid attack, very probably *Schizoneura americana* Riley. Potato beetles are very rarely seen, though many eggs have been observed. The foliage of the few potatoes above ground is badly eaten by the black flea beetle. Nests of the apple-tree tent caterpillar are very scarce and with but few tenants. Currant aphid continues abundant.—*June 3*. Rose beetles (*Macrodactylus subspinosus* Fabr.) were observed for the first time on rosebushes June 4, and considerable damage has been inflicted. A species of plant louse (*Chaitophorus negundinis* Thos.) has appeared somewhat abundantly on the ash-leaf maple. Grasshoppers are becoming quite abundant in old pastures. The scarcity of potato beetles is cause for general comment, and the black flea beetles are exceedingly numerous on potato and tomato vines.—*June 10*. A few full-grown forest tent caterpillar larvae (*Malacosoma disstria* Hübn.) were observed. Spittle insects are uncommonly abundant on grass under a spreading shade tree. Rose beetles (*Macrodactylus subspinosus* Fabr.) are abundant on apple-trees, on thorn apple, and very numerous on white daisy and dock. The daisy flowers are eaten off in many instances.—*June 17*. Potato beetle larvae were observed on one plant June 22, and a few striped cucumber beetles (*Diabrotica vittata* Harr.) were noticed on lima beans. The currant aphid (*Myzus ribis* Fabr.) is causing very little damage, while tomato and potato vines are considerably injured by the black flea beetle.—*June 24*. Currant leaves appear as though they had been eaten by the sawfly, though no larvae have been observed. The little plant louse (*Drepanosiphum aceris*

folii Thos.) appears to be quite common on a number of varieties of maple and is causing some injury.—*July 1.* Black-headed cabbage worms (*Evergestis stramenalis* Hübn.) are causing some injury to turnips. Some caterpillars, probably fall webworms (*Hyphantria textor* Harr.) have appeared in small numbers on an appletree. Plant lice are abundant on many plants, such as apple, elm, box-elder, birch, wild cherry, burdock, pigweed and dock. Though potato beetles were never so inconspicuous, there are plenty of grubs.—*July 22.* The maple aphid (*Drepanosiphum acerifolii* Thos.) appears to be the cause of much premature falling of leaves, the pests being generally distributed, occurring even in the tops of trees 60 feet high. Plant lice have appeared in some numbers on red rose bushes.—*July 29.* There is apparently another brood of black-headed cabbage worms at work, if size is any indication. Plant lice (probably *Aphis brassicae* Linn.), are numerous on turnips. The appletree plant louse (*Aphis mali* Fabr.) is abundant and seriously injuring appletrees. The pests are specially abundant on new, tender shoots. Cherrytrees are very little affected, and plumtrees more so, but in the latter case black knot is also prevalent. Grasshoppers are generally scarce, though in a few localities they are abundant. Cabbage butterfly (*Pieris rapae* Linn.) has not been very abundant so far this season.—*Aug. 4.* A psocid (*Psocus? venosus* Burm.) was found in clusters of 200 or more on the trunks of maple, and a few were also observed on appletrees. In some cases the bark of the tree seemed to be whitened as though it were partially eaten, probably by the insects gnawing away the lichens and outer portions of the bark. Larvae of the elm flea beetle (*Disonycha triangularis* Say) are very plentiful on elmtrees near by and have severely injured the foliage.—*Aug. 12.* A small, yellowish leaf hopper (? jassid) is abundant on beans and has apparently caused considerable yellowing of the foliage. Yellow-necked appletree worm (*Datana ministra* Drury) is present in small numbers, and the same is also true of the fall webworm. The brown and black woolly bears (*Pyrharctia isabella*

Abb. & Sm.) were unusually numerous in a timothy field.—*Aug. 12.* Plant lice are numerous on beans, and on sunflowers there is a similar species. Codling moth larvae (*Carpocapsa pomonella* Schiff.) have begun operations, and wormy apples are not uncommon. Plant lice continue abundant on pigweed.—*Aug. 19.* Horn flies (*Hæmatobia serrata* Rob.-Desv.) and horseflies have been very troublesome for the past two weeks. A few caterpillars of *Apateia americana* Harr. were observed on soft maple today. Fall webworms (*Hyphantria textor* Harr.) are apparently more abundant than last year, occurring in some numbers on apple trees. Hornet nests are more numerous than usual.—*Aug. 25.* Butternut trees are very badly eaten in some places by *Datanella integrissima* Gr. & Rob. Fall webworms continue to be unusually abundant.—*Sep. 1.* Plant lice (*Chaitophorus negundinis* Thos.) still continue abundant on box-elder. Apples are comparatively scarce this year and appear to be wormier than ever. A few webworm nests were observed on lilac and alder today.—*Sep. 16.* *Pieris* larvae are injuring foliage of cultivated nasturtiums to a considerable extent.—*Oct. 1*

Onondaga county [Mrs A. M. A. Jackson, Camillus]—First nest of an appletree tent caterpillar (*Malacosoma americana* Fabr.) was observed Ap. 26, and the present indications are that this insect will not be as abundant as usual. There is a report that Hessian fly (*Cecidomyia destructor* Say) is working in some fields.—*Ap. 28.* The blue or meat fly is quite abundant about houses. Cabbage butterflies (*Pieris rapae* Linn.) are about, though not numerous. Spotted lady beetles occur on many weeds and plants, and though abundant do not appear to be destructive. Tent caterpillars are not numerous and are causing very little injury. Cold, inclement weather has kept caterpillars and other insects in check. Examination of one wheat field showed no Hessian fly, and growers state that thus far none has been met with.—*May 6.* Cankerworms appeared May 12 and are quite abundant and destructive. The bud moth (*Timetocera ocellana* Schiff.) is at work on apple trees, though

not causing very much injury. The forest tent caterpillar (*Malacosoma? disstria* Hübn.) has appeared in very small numbers on chokecherry trees. The weather is dry and warm and consequently favorable to the development of insect life. Many clover leaves have small, round holes eaten in them, possibly the work of the clover leaf weevil (*Phytonomus punctatus* Fabr.).—*May 13*. Cankerworms are developing rapidly and have caused a great deal of injury. Ants of several species are quite abundant.—*May 20*. Red admiral butterflies (*Vanessa atlantica* Linn.) have appeared but are not as abundant as usual. The appletree tent caterpillar is quite scarce, only five webs or nests being observed in a 5 mile drive. Cankerworms are abundant, and while many trees have been injured to a considerable extent, none have been entirely defoliated. Potato beetles (*Doryphora 10-lineata* Say) have appeared and deposited some eggs. Cold weather is keeping insects in control. Green plant lice are somewhat abundant on rosebushes. Currant worms (*Pteronous ribesii* Scop.) are present in small numbers, though not causing much damage. Red admiral butterflies continue scarce and others are not so numerous as usual. Potato beetles and their eggs are very abundant on early potatoes. A white frost occurred May 31 and June 1, but did not seriously affect insects.—*June 1*. Plum curculios (*Conotrachelus nenuphar* Herbst.) have stung much fruit and considerable is dropping. Cankerworms have about all disappeared and have not caused as much injury as in former years. Many farmers think that tent caterpillars hatched during the warm days of March and were killed by the cold weather which followed, or else perished from lack of food. This hardly seems probable, as instances have been recorded where eggs of this species hatched in the fall and the caterpillars successfully survived the winter in the latitude of Missouri.—*June 10*. There are but few cocoons of the tent caterpillars, and this appears to be due in part to the continuous wet weather of 1902, when the caterpillars ate but little, were not healthy and appeared to be only partly grown at the time they spun up. A very

few Hessian flies are to be found in the "flaxseed" stage, though no complaints of their work have been received. A leaf miner, probably *Pegomyia vicina* Lintn., is very abundant in a large field of beets. Spittle insects are quite common in certain fields of grass. Potato beetle eggs are hatching, but the grubs do not appear to be as numerous as the old ones and are causing comparatively little damage. Black flea beetles (*Crepidodera cucumeris* Harr.) have caused some injury to both tomato and potato vines. Striped cucumber beetles (*Diabrotica vittata* Fabr.) are present on pumpkin vines but are not causing much injury. No squash bugs (*Anasa tristis* DeGeer) have been observed this year, though they are usually very abundant and destructive in this section. Rose beetles (*Macrodactylus subspinosus* Fabr.) are quite destructive to rose bushes, though late in appearing, and leaf hoppers have also caused some injury to rose bushes. Vines are more free from weevils (*Bruchus pisorum* Linn.) than usual, but the vines are being eaten by a green worm similar to the cabbage worm. House flies are not as abundant as usual.—*June 29*

Orange county [J. M. Dolph, Port Jervis]—A few mourning loaks (*Euvanesa antiopa* Linn.) and some *Colias* butterflies have appeared. Many small bees are frequenting plum blossoms.—*April 23*. Plant lice (*Aphis mali* Fabr. and *A. cerasi* Fabr.) are very numerous, specially on apple and cherry trees and rose bushes. Tomato plants are also affected by a species of plantlouse which may be *Rhopalosiphum olani* Thos. In general there are fewer insects than usual, due probably to the exceedingly dry weather.—*June 2*. Potato beetles (*Doryphora 10-lineata* Say) have made their appearance in considerable numbers, the first abroad on May 20, and the first larvae being observed June 9. Hundreds of lady beetles were found on a crimson rambler rose, three or four on a leaf. We have never seen them in such great numbers before. This bush had been badly infested by plant lice, and the lady beetles were undoubtedly attracted by their prey. The currant

worm (*Pteronus ribesii* Scop.) has caused some injury though it has not been abundant as in former years. The spiny elm caterpillars (*Eu Vanessa antiopa* Linn.) have stripped the leaves from a number of North Carolina poplars planted for shade tree purposes.—*June 11.* Striped cucumber beetles (*Dia-brotica vittata* Fabr.) have appeared in considerable numbers. Pear and cherry slug (*Eriocampoides lima-cina* Retz.) is inflicting much injury on the foliage of peartrees. Rose beetles (*Macro dactylus subspinosus* Fabr.) have been specially numerous and abundant this year. The foliage of very few bushes has escaped being eaten or seriously disfigured.—*June 30*

Rockland county [S. B. Husted, Blauvelt]—Appletree tent caterpillars (*Malacosoma americana* Fabr.) appeared as usual but have not done as much injury as in former years. No potato beetles have appeared, while plant lice (*Myzus cerasi* Fabr. and *M. ribis* Fabr.) are unusually abundant on cherry and currant bushes. Cutworms are reported rather plenty and cedar birds have been unusually numerous on cherry-trees, probably being more noticeable on account of the scarcity of fruit.—*June 7*

St Lawrence county [C. J. Locke, Ogdensburg]—June bugs and grubs were abundant May 1. 90% of the birch trees in this section are affected by a borer, possibly the bronze birch borer (*Agri lus anxius* Lec.), and an equal proportion of poplar trees are also injured. These latter may possibly be affected by a buprestid, though it is not improbable that considerable damage is caused by the poplar borer (*Saperda calcarata* Say). The gouty gall beetle (*O berea bimaculata* Oliv.) is causing considerable injury in blackberry patches. Appletree borers (*Saperda candida* Fabr.) are abundant and infest many appletrees. Woodpeckers are at work on infested trees, and have undoubtedly destroyed many grubs.—*May 16.* Mourning cloak butterflies (*Eu Vanessa antiopa* Linn.) were first observed May 18, and cabbage butterflies (*Pieris rapae* Linn.) on the 22d. Currant worms (*Pteron us ribesii*

Scop.) put in appearance May 18, and the same is true of the appletree aphid (*Aphis mali* Fabr.).—*May 22.* Eggs of the potato beetle (*Doryphora 10-lineata* Say) were observed May 21, and shad flies or May flies, the 22d. Mosquitos were abundant on the 25th. Generally speaking, no insects are specially injurious.—*May 28.* Cucumber beetles (*Diabrotica vittata* Fabr.) were very numerous June 4; same was true on the 10th of strawberry weevil (? *Anthonomus signatus* Say) and potato beetles. White grubs are abundant and totally destroying oats.—*June 11.* Cabbage worms appeared on the 20th, and onion maggots (*Phorbia ceparum* Meigen) were at work the 22d. This latter insect has destroyed one fourth of the onion crop. Cabbages have likewise suffered from the maggot (*Phorbia brassicae* Bouché). Rose slugs were observed at work on the 23d.—*June 25.* A second brood of currant worms appeared July 1. Cabbage worms, cucumber beetles, plant lice and onion maggots are very numerous and destructive. The wet weather continues, accompanied by an increase of leaf-eating insects. The foliage of appletrees, plumbtrees, maples and elms are all attacked by plant lice. Some apples are dropping and show no sign of injury except at the end of the stem, probably the work of the codling moth (*Carpocapsa pomonella* Schiff.).—*July 9.* Crane flies and dragon flies were numerous July 10, and a single specimen of the tomato worm (*Phlegonthus 5-maculatus* Haw.) was observed on the 15th. Cabbage worms, potato beetles and plant lice continue abundant and destructive. Mosquitos are abundant and rains continue. Striped cucumber beetles and plant lice are attacking vines, egg plants and wild tansy.—*July 16.* White marked tussock moths (*Notolophus leucostigma* Abb. & Sm.) were observed July 20, and dragon flies on the 15th. Potato beetles are abundant and plant lice very numerous, mosquitos are rare. Cool and wet weather has interfered with the successful application and efficiency of insecticides, and as a consequence caterpillars are abundant. Apples are dropping from the tree, and only about one quarter of the crop will be saved. Most of the trouble is

probably caused by the codling moth larvae.—*July 30.* Fall webworms (*Hyphantria textor* Harr.) appeared July 15 on plum, apple and elm trees, and a species of sawfly on asters.—*Aug. 8.* Potato beetles continue numerous and destructive. Cool, wet weather has not affected the leaf-eating caterpillars or plant lice, both of which continue abundant.—*Aug. 14*

Saratoga county [C. W. Ferris, Schuyler]—Appletree tent caterpillars (*Malacosma americana* Fabr.) are present in some numbers and were not injured by a frost, the mercury dropping to 24 F. on May 2.—*May 5.* Cherry aphid (*Myzus cerasi* Fabr.) are abundant on sweet cherries, and a green plant louse is affecting Bose peartrees very seriously.—*July 15*

Schenectady county [Paul Roach, Quaker Street, Schenectady co.]—Appletree tent caterpillars (*Malacosoma americana* Fabr.) are just hatching on trees in warm situations. Their numbers are small, and but few egg clusters have been observed.—*May 1*

Schuyler county [Mrs Harriet S. Updyke, Logan]—Appletree tent caterpillars (*Malacosoma americana* Fabr.) appeared for the first time May 8. They have not caused as much damage as usual.—*May 20*

Ulster county [George S. Clark, Milton]—Appletree tent caterpillars (*Malacosoma americana* Fabr.) have been at work for two weeks and were not affected by the frost of April 12, even though they were not protected by a web.—*Ap. 23.* Tent caterpillar nests are present in large numbers except in localities where they were carefully destroyed the preceding year.—*Ap. 30.* Tent caterpillars continue to increase in size, and their nests are becoming more conspicuous. Aphid (*Myzus cerasi* Fabr.) are beginning to appear on cherrytrees. Currant worms (*Pteronus ribesii* Scop.) are abundant on bushes that were not sprayed last year, and a few occur on those that were treated.—*May 14.* There has been no increase in appletree tent caterpillars, and currant worms are few, specially on bushes that were sprayed last year. Plant lice (*Myzus cerasi* Fabr.) are increasing on

cherrytrees, and it is now too late to reach them because the leaves are so badly curled. Some plant lice (*Aphis mali* Fabr.) have developed on appletrees. The black flea beetle (*Crepidodera cucumeris* Harr.) is working on potato, tomato vines and eggplants. Some caterpillars, probably those of the gartered plume moth (*Oxyptilus periscelidactylus* Fitch) are not doing much damage.—*May 21*. Tent caterpillars are beginning to crawl, evidently preparatory to pupation, and are not more than one quarter as abundant as last year. Plant lice are numerous on cherrytrees, specially young ones. The red spider (*Tetranychus telarius* Linn.) is abundant on roses.—*May 28*. A few potato bugs have just appeared, and plant lice are more abundant on cherrytrees than usual. Tent caterpillars do not appear to be as energetic as usual, possibly they were weakened by the early frost. Elm leaf beetles (*Galerucella luteola* Müll.) are very scarce, not a sign of one could be found on a large tree which had its foliage entirely destroyed two years ago.—*June 4*. Heavy rains have washed many of the aphids from the trees. Many plant lice continue on rosebushes that have not been sprayed.—*June 12*. The recent continued rains have prevented much damage from insect pests. Squash bugs (*Anasa tristis* DeGeer) are abundant enough to destroy the vines unless controlled. Some pear psylla (*Psylla pyricola* Forst.) has appeared on the trees in various pear orchards in this vicinity.—*June 18*. Pear psylla is injuring many trees and causing much of the fruit to drop. Plant lice are abundant on both young pear and apple trees.—*July 2*

Warren county [C. L. Williams, Glens Falls]—May beetles appeared in large numbers May 9. The asparagus beetle (*Crioceris asparagi* Linn.) was observed in considerable numbers May 16. It has become distributed over a tract at least 8 miles long and is abundant.—*May 25*. Rose beetles (*Macrodactylus subspinosus* Fabr.) appeared about June 22, and the depredations of a gray cutworm attracted attention about the same time. The former are very abundant and feed on all kinds of vegetation. The zebra caterpillar (*Mamestra*

picta Harr.) was found at work on strawberry plants.—*June 9.* June beetles are exceedingly abundant; more so than we have known for years.—*July 3.* The stalk borer (*Papaipema nitela* Guen.) is at work in small numbers on various plants, and we have succeeded in detecting a parasite on the same, which proves to be a tachinid.

Wayne county [C. H. Stuart, Newark]—The first aphids were observed on roses May 5, and comparatively few plants were infested. No tent caterpillars or cankerworms have been observed, and the spotted asparagus beetle (*Crioceris punctata* Linn.) has disappeared, though the common species (*C. asparagi* Linn.) is present in force. House flies are scarce and occur only on the sunny side of buildings.—*May 19.* Plant lice began to appear the latter part of May, and have been more abundant than we have ever known them to be before. They oblige us to keep a gang of 15 or 20 men and boys at work continuously in the nursery with a whale oil soap solution to keep them in check. Larvae of lady beetles are more than usually abundant and are undoubtedly doing good service. On our lawn the only trees or plants that have escaped plant lice are poppies and evergreens; everything else is literally covered with them, or at least was so a week ago. Now the lady beetles are beginning to get the upper hand of the pests.—*July 2*

Westchester county [F. R. Calkins, Ossining]—Elm leaf beetles (*Galerucella luteola* Müll.) appeared May 3 and have been increasing rapidly but have caused no serious damage.—*May 4.* Bumble flower beetles (*Euphoria inda* Fabr.) were flying about in considerable numbers. Hundreds of them were observed, though there was no evidence of material injury. Grasshoppers were first seen May 6 and have become very numerous. Striped cucumber beetles (*Diabrotica vittata* Fabr.) appeared in large numbers on the 8th. The first Colorado potato beetles (*Doryphora 10-lineata* Say) were observed on the 15th. Appletree tent caterpillars (*Malacosoma americana* Fabr.) are causing a great deal of injury in this section, and species of plant lice are curling the leaves of various shrubs in this vicinity.—*May 18.* The majority of elms in this

section are in very bad condition owing to the work of the elm leaf beetle. Striped cucumber beetles continue very numerous, and potato beetles have appeared in the past week in increasing numbers. It looks as though the appletree tent caterpillars had been destroyed by some climatic condition; possibly the severe rains in May and June. Since we had 31 days of rain with hardly a ray of sunshine, the webs are empty and there are no signs of cocoons. Mosquitos are somewhat scarce. The work of the pear midge (*Diplosis pyrivora* Riley) is very evident, and cherry borers (probably the fruit tree bark beetles *Scolytus rugulosus* Ratz.), have ruined some trees.—*July 13*

Westchester county [Mrs Edwin H. Mairs, Irvington-on-Hudson]—White marked tussock moth caterpillars (*Notolophus leucostigma* Abb. & Sm.) are injuring the foliage of a fine purple beech, which is also suffering severely from plant lice, probably the woolly beech aphid (*Phyllaphis fagi* Linn.). Mapletrees have dropped many leaves, probably because of plant lice injury. Very likely this is the work of *Chaitophorus aceris* Thos.—*June 29*. A curious worm (*Seirodontia bilineata* Pack.) was found feeding on foliage of purple beech. Mosquitos are more abundant than ever. Elm leaf beetle larvae (*Galerucella luteola* Müll.) are crawling along the trunks of infested trees, the foliage of which is turning brown. American, English, weeping and slippery elms are all attacked. Maple and beech trees are still suffering from plant lice injury. Some red bugs are present on the infested trees.—*July 12*

Wyoming county [W. H. Roeper, Wyoming]—Appletree tent caterpillars (*Malacosoma americana* Fabr.) were first observed May 2. They are present in small numbers, and some think this is due to the excessively cold weather.—*May 9*. Insects of various kinds are much scarcer than usual.—*May 18*. Tent caterpillars are not causing much injury though canker-worms are working to some extent. The weather continues very cold at night, and it is exceedingly dry.—*May 25*. Codling moth larvae (*Carpocapsa pomonella* Schiff.) are unusually abundant in this locality, and apple aphid (*Aphis mali* Fabr.) is very numerous and rolling the leaves to a con-

siderable extent. The injury is so severe that it would not be surprising if a considerable proportion of the foliage dropped. Potato beetles (*Doryphora 10-lineata* Say) are present in large numbers. Plant lice are also working on forest trees in about the same way as on fruit trees. The weather continues very dry and appears to be favorable to plant lice. The apple crop will be only about one quarter its normal size, and pears are almost a failure. Plant lice continue to be the most destructive form in this section, and the injury is so severe that some trees have half their leaves badly curled by the pests. A good rain has benefited crops very much.—*June 15.* Maple foliage is dropping to a considerable extent, probably as a result of injury by plant lice (*Drepanosiphum acerifolii* Thos.)—*July 3*

LIST OF PUBLICATIONS OF THE ENTOMOLOGIST

The following is a list of the principal publications of the entomologist during the year 1903. 70 are given with the title,¹ place, time of publication and a summary of the contents of each. Volume and page number are separated by a colon, the first superior figure tells the column, and the second the exact place in the column in ninths; e.g. 67:974¹⁶ means volume 67, page 974, column 1, beginning in the sixth ninth, i.e. about two thirds of the way down.

Turnips.. Country Gentleman, Nov. 27, 1902. 67:974¹⁶

The work of the cabbage root maggot, *Phorbia brassicae* Bouché, in turnips is identified and remedial measures discussed.

Experimental Work in New York State against the San José Scale [*Aspidiotus perniciosus* Comst.] U. S. Dep't Agric. Div. Ent. Bul. 37, n.s. 1902. p.35-36

Discussion of results obtained with 20% mechanical crude petroleum emulsion and whale oil soap.

Notes for the Year in New York. U. S. Dep't Agric. Div. Ent. Bul. 37, n.s. 1902. p.102-3

Brief records of injury by grapevine root worm, *Fidia viticida* Walsh; grapevine leaf hopper, *Typhlocyba comes* var. *vitis* Harr.;

¹Titles are given as published, and in some instances they have been changed or supplied by the editors of the various papers.

appletree tent caterpillar, *Clisiocampa* [Malacosoma] americana Fabr.; forest tent caterpillar, *Clisiocampa* [Malacosoma] disstria Hüb. and fall webworm, *Hyphantria cunea* Drury [textor Harr.].

Observations on Certain Insects Attacking Pine Trees. U. S. Dep't Agric. Div. Ent. Bul. 37, n.s. 1902. p.103-4

Records of injuries by *Tomiscus calligraphus* Germ., *T. pini* Say and also of *Monohammus confusus* Kirby and *Dendroctonus terebrans* Oliv.

Potato Wireworms. Country Gentleman, Dec. 4, 1902, 57:992¹³

General remedial measures for wireworms are briefly discussed.

Crude Petroleum as an Insecticide. Soc. Promotion Agric. Sci.

Proc. 23d An. Meeting 1902, p.86-95; separate p.1-10 received Dec. 24, 1902

A review of experiments with crude petroleum and summary of results in controlling San José scale, *Aspidiotus perniciosus* Comst.

Maggots in Mushrooms. Country Gentleman, Jan. 1, 1903, 68:6¹⁵

Brief account of species injuring mushrooms and remedies therefor, *Phora agarici* Lint. and species of *Sciara* being mentioned in particular.

Entomology. U. S. N. Y. Handbook 16, revised Dec. 1902, p.1-12, issued Jan. 3, 1903

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Grapevine Root Worm [*Fidia viticida* Walsh]. N. Y. State

Mus. Bul. 59. 1902. p.49-84, 1 col.pl. 4 halftones

Issued Jan. 5, 1903. Republished in great part in issues of *Grape Belt* [Dunkirk N. Y.] for Jan. 9, 13, 20, 27, Feb. 3, 10.

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Cucumber Beetle. Country Gentleman, Jan. 15, 1903, 68:43²⁴

Remedial measures for the striped cucumber beetle, *Diabrotica vittata* Fabr.

Insecticides and Notes. Country Gentleman, Jan. 15, 1903, 68:47³⁵

Summary of results obtained with insecticides against San José scale, *Aspidiotus perniciosus* Comst., and notes on the Chinese ladybug, *Chilocorus similis* Rossi, and the grapevine root worm, *Fidia viticida* Walsh.

Beware the Pea Weevil. Country Gentleman, Jan. 22, 1903, 68:63⁴²

Injuries by *Bruchus pisorum* Linn. in Canada and means of controlling.

Legislation against Pests. Country Gentleman, Jan. 29, 1903, 68:89²⁵

General discussion of the efficacy of nursery inspection work with comments on present conditions.

The San José Scale. Country Gentleman, Feb. 19, 1903, 68:158¹¹

Comparative value of crude petroleum emulsion, lime, salt and sulfur mixture and whale oil soap for *Aspidiotus perniciosus* Comst.

Beneficial Insects. Country Gentleman, Mar. 5, 1903, 68:206³³

General observations on the establishment of *Scutellista cyanea* Motsch, *Novius cardinalis* Mask. and *Chilocorus similis* Rossi in the United States.

Scale Insects. Worcester [Mass.] Evening Gazette, Mar. 12, 1903, p.1

Summary notice of scale insects with special reference to remedies for the San José scale, *Aspidiotus perniciosus* Comst.

Arsenate of Lead. Country Gentleman, Mar. 19, 1903, 68:252¹⁷

Formula and method of preparation.

Looper Caterpillar. Country Gentleman, Mar. 19, 1903, 68:252²³

Description too brief to permit identification of the geometrid.

Grapevine Root Worm. Country Gentleman, Mar. 19, 1903, 68:255³⁴

Corrects reported error and gives estimates of damage by *Fidia viticida* Walsh.

Recent Work with Insecticides in the East. Col. State Bd Hort. Rep't 1902. 1903. p.121-27

Brief discussion of the value of arsenate of lead, crude petroleum, the lime, salt and sulfur mixture and whale oil soap as insecticides.

Fleas. Country Gentleman, Mar. 26, 1903, 68:276¹⁶

Brief account of life history with various repressive measures.

Appletree Bark Louse. Country Gentleman, Mar. 26, 1903, 68:276²⁴

Remedial measures for *Mytilaspis pomorum* Bouché [*Lepidosaphes ulmi* Linn.].

Insecticides and Fungicides. U. S. N. Y. Handbook 18, p.16

More important formulas recommended with general directions for use.

Pea Weevil. Country Gentleman, Ap. 2, 1903, 68:293²⁴

Discussion of rise in temperature in peas infested with *Bruchus pisorum* Linn. and methods of controlling the pest.

San José Scale. Country Gentleman, Ap. 2, 1903, 68:300¹²

No danger of *Aspidiotus perniciosus* Comst. spreading from infested wood cut in early spring.

Elm Leaf Beetle. Schenectady Daily Union, Ap. 3, 1903, p.7

Nearly the same in Evening Star [Schenectady] Ap. 3, p.12.

Extracts from Museum Bulletin 57 on *Galerucella luteola* Müll., with special reference to local conditions.

Shade Tree Ratings. Street forestry report on the selection, planting, cultivation and care of street shade trees by Fred-eric Shonnard, Dep't Public Works, Yonkers, 1903

Ratings of comparative immunity from insect enemies of various shade trees.

Dust and Other Sprays. Country Gentleman, Ap. 16, 1903, 68:350²³

Brief discussion of various insecticides with special reference to scale insects and dry or dust sprays.

Advice about Spraying. Country Gentleman, Ap. 30, 1903, 68:392²¹

General directions for spraying with references to convenient literature.

Arsenate of Lead. Country Gentleman, May 7, 1903, 68:410³⁵

Its preparation from arsenic, soda and sugar of lead not advisable. Directions are given for making it.

Literature of American Economic Entomology. Am. Ass'n Eco. Ent. 15th An. Meeting, Presidential address, Washington D. C. Dec. 26, 1902. U. S. Dep't Agric. Div. Ent. Bul. 40, n.s. 1903. p.7-22

Also published separately.

After a general review with a few statistics regarding the amount of literature relating to some of the more notorious insects, the following topics were discussed: Newspaper and Minor Articles; Reports; Bulletins; Journals; General Works and Indexes.

Work and Observations in 1902. N. Y. State Fruit Growers Ass'n Rep't 1903, p.92-94. Rec'd May 15

Results obtained with crude petroleum, whale oil soap and lime, salt and sulfur against San José scale, *Aspidiotus perniciosus* Comst. Notes on the establishment of *Chilocorus similis* Rossi and work of grapevine root worm, *Fidia viticida* Walsh.

Elm Leaf Beetle Ravages. Argus [Albany] May 16, 1903; New York Times, May 17; Rensselaer County Standard [Hoosick Falls] May 22, 1903, p.4

Summary of injuries by *Galerucella luteola* Müll. in Hudson river valley.

New York Entomologic Service. Country Gentleman, May 21, 1903, 68:451³⁶

Summary of reports from voluntary observers.

Diseases and Pests. N. Y. State Lib. Bul. 80. Review of Legislation 1902, p.837-38

Summary of recent laws relating to plant diseases and insect enemies.

Importance of Injurious Insects Introduced from Abroad. Soc. Promotion Agric. Sci. Proc. 24th An. Meeting 1903, p.39-48; separate, p.1-10

Summarized account of injuries with classified lists of introduced species and notes on the relative importance of various species.

New York Entomologic Service. Country Gentleman, May 28, 1903, 68:471³³

Summaries of reports from voluntary observers.

18th Report of the State Entomologist on Injurious and Other Insects of the State of New York 1902. N. Y. State Mus. Bul. 64. 1903. p.89-193, 1 lith. 5 halftones

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New York Entomologic Service. Country Gentleman, June 4, 1903, 68:498¹⁴

Summary of reports from voluntary observers.

Remedies for Grapevine Root Worms. Grape Belt, June 16, 1903, p.2

Brief statement of remedial measures for *Fidia viticida* Walsh.

New York Entomologic Service. Country Gentleman, June 18, 1903, 68:530³⁸

Summary of reports from voluntary observers.

Hints to Fruit Growers and Truckers. Am. Agric. June 20, 1903, 71:648²⁴

Briefly discusses the grapevine root worm, *Fidia viticida* Walsh, injuries in Chautauqua grape belt and remedies for same, and also the plum curculio, asparagus beetles, and insect enemies of squash.

New York Entomologic Service. Country Gentleman, June 25, 1903, 68:551¹²

Summary of reports from voluntary observers.

Destroying Flies. Country Gentleman, June 25, 1903, 68:561²¹

Destructive and preventive measures for the house fly, *Musca domestica* Linn.

Grapevine Root Worm. Grape Belt, June 26, 1903, p.1, 6

Beetles attack best vineyards, no decided migration, figures on efficacy of destroying pupae and remarks on value of beetle catchers and arsenical poisons for *Fidia viticida* Walsh.

Mosquitos. N. Y. State Mus. folder. Sp.

Issued June 29, 1903.

Brief description with discussion of habits, life history, genera and species, methods of controlling and collecting.

Grapevine Root Worm. Grape Belt, June 30, 1903, p.4

Results of breeding from entire vines and efficiency of beetle catchers for *Fidia viticida* Walsh.

New York Entomologic Service. Country Gentleman, July 2, 1903, 68:578³³

Summary of reports from voluntary observers.

Plant Lice. Country Gentleman, July 9, 1903, 68:590²⁷

Remedial measures for plant lice on fruit trees.

Killing Ants. Country Gentleman, July 9, 1903, 68:590³²

Method of destroying ants in nests.

Rose Beetles. Country Gentleman, July 9, 1903, 68:590³⁴

Methods of destroying the beetles, *Macrodactylus subspinosus* Fabr.

New York Entomologic Service. Country Gentleman, July 9, 1903, 68:590⁴⁵

Summary of reports from voluntary observers.

About Maple Tree Borers. Rome Daily Sentinel, July 10, 1903

Methods of controlling the sugar maple borer, *Plagionotus speciosus* Say.

Plant Lice. Country Gentleman, July 16, 1903, 68:610²⁷

Comments on unusual abundance of plant lice and remedies for the same.

New York Entomologic Service. Country Gentleman, July 16, 1903, 68:610⁴⁷

Summary of reports from voluntary observers.

Mosquitos. Sunday [Albany] Press, July 19, 1903, p.6

Reprint of portions of mosquito folder.

Spray for Potatoes. Country Gentleman, July 23, 1903, 68:630¹⁷

Advises arsenate of lead for potato beetles and bordeaux mixture for fungus.

New York Entomologic Service. Country Gentleman, July 23, 1903, 68:630⁴³

Summary of reports from voluntary observers.

Plant Lice. Country Gentleman, July 30, 1903, 68:650³⁴

Remedies for the pests.

New York Entomologic Service. Country Gentleman, July 30, 1903, 60:650⁴⁵

Summary of reports from voluntary observers.

Forest Fires and Insect Attack. Am. Lumberman, Aug. 8, 1903, p.15

Preliminary report on investigations in burned areas in the Adirondacks.

Aquatic Nematocerous Diptera by Oskar Augustus Johannsen.

Reprint from N. Y. State Mus. Bul. 68. 1903. p.328-441

Issued Aug. 11, 1903.

This paper includes a key to families of nematocerous diptera with accounts of the net-winged midges (Blepharoceridae), black flies (Simuliidae) and mosquitos (Culicidae).

Tulip Tree Scale. Country Gentleman, Aug. 20, 1903, 68:712²⁵

Brief notice with remedies for *Lecanium* [*Eulecanium*] *tulipiferae* Cook.

Summary of Root Worm Situation and Experiments. Grape Belt,

Sep. 4, 1903, p.1; Jamestown Journal, Sep. 4, 1903, p.1; Country

Gentleman, Sep. 24, 1903, 68:828²⁷

Brief summary of observations and experimental work on *Fidia viticida* Walsh in 1903.

Mosquitos on High Ground. Country Gentleman, Sep. 10, 1903, 68:781²⁴

Brief comments on the breeding habits and methods of controlling these insects.

Aquatic Chrysomelidae and a Table of the Families of Coleopterous

Larvae by Alex. D. MacGillivray. Reprint from N. Y. State

Mus. Bul. 68. 1903. p.288-331

Issued Sep. 12, 1903.

This paper includes a key to families of coleopterous larvae and a monograph of the subfamily Donaciinae, family Chrysomelidae.

Aquatic Insects of New York State. N. Y. State Mus. Bul. 68. 1903. p.199-517, 52 pl. (3 col.) by James G. Needham Ph.D., professor of biology, Lake Forest Univ.; A. D. MacGillivray Ph.D., instructor in entomology, O. A. Johannsen M.S., instructor in civil engineering, both of Cornell Univ.; and K. C. Davis Ph.D., professor of horticulture, West Virginia Univ.
 Issued Sep. 28, 1903.

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Sialididae of North and South America by K. C. Davis. Reprint from N. Y. State Mus. Bul. 68. 1903. p.441-87

Issued Sep. 30, 1903.

A systematic and biologic account of this group.

Two Tree Pests. Country Gentleman, Oct. 1, 1903, 68:852⁴³

Pear psylla, *Psylla pyricola* Forst. probably weakened the pear trees at Hartley Hall Pa., so that they were attacked by the fruit tree bark beetle, *Scolytus rugulosus* Ratz. Destruction of the infested trees by fire is advisable. The maple is probably infested by *Sesia acerni* Clem. Preventive measures are indicated.

Chinese Lady Bugs. Country Gentleman, Oct. 8, 1903, 68:871¹⁸

Records establishment and breeding of *Chilocorus similis* Rossi at Kinderhook N. Y.

INSECT EXCHANGE

The state collection of insects contains large numbers of many local, and in some cases somewhat rare forms. This, in connection with the fact that many species are not represented, and specially in view of the economic importance of introduced insects, led us to inaugurate a system of exchanges the past summer.

Those offered for exchange are, in every case, only such as can be

spared without detriment to the general collections, and in return it has been our desire to obtain, so far as possible, species of economic importance in other sections of this country or any other countries, specially those which might develop into injurious pests. A preliminary exchange list was sent out in the early summer, and the results have been very gratifying, since we have been able by this means, to make a number of extremely valuable additions to the state collections. This is specially true in the case of Coccidae, and was largely possible through the kindness of Prof. V. L. Kellogg of Leland Stanford Jr University, who was able to offer us some extremely desirable Californian and Japanese scale insects in exchange for some of our native forms. Another very desirable exchange was arranged with Prof. F. H. Snow of Kansas University, who sent valuable Diptera and some cotypes, all determined by the noted authority in this group, Dr S. W. Williston. The species, 418 in number, acquired in this manner are listed below.

SPECIES RECEIVED IN EXCHANGE

The source of various species listed below, is indicated by superior figures following the author of the species, as follows:

1, from Prof. C. P. Gillette, Agricultural College, Fort Collins Col.; 2, from Prof. V. L. Kellogg, Leland Stanford Jr University, California; 3, from E. M. Ehrhorn, Mountain View Cal.; 4, from Prof. F. H. Snow, University of Kansas, Lawrence Kan.; 5, from Prof. E. A. Popenoe, state entomologist, Topeka Kan.; 6, from Prof. H. Garman, Agricultural Experiment Station, Lexington Ky.; 7, from J. G. Sanders, 8, from Prof. Herbert Osborn, both of the Ohio State University, Columbus O.

Hymenoptera

Bombus separatus Cress.¹
B. sylvicola Kirby¹
B. putnami Cress.¹
B. proximus Cress.¹
B. nevadensis Cress.¹
B. morrisonii Cress.¹
B. mixtus Cress.¹
B. juxtus Cress.¹
B. flavifrons Cress.¹

B. bifarius Cress.¹
B. appositus Cress.¹
Psithyrus insularis Cress.¹
Anthopora vallorum Ckll.¹
A. urbana Cress.¹
A. smithii Cress.¹
A. occidentalis Cress.¹
Synhalonia frater Cress.¹
Melissodes obliqua Say¹

Diadasia australis Cress.¹
D. diminuta Cress.¹
Megachile montivaga Cress.¹
M. fidelis Cress.¹
Lithurgus apicalis Cress.¹
Anthidium maculifrons Smith¹
A. interruptum Say¹
Coelioxys gilensis Okill.¹
Augochlora coloradensis Titus¹
Epeolus robustus Cress.¹
E. occidentalis Cress.¹

E. concavus Cress.¹
E. compactus Cress.¹
Nomada ridingsii Cress.¹
Vespa occidentalis Cress.¹
Polybia flavitarsis Sauss.¹
Odynerus taos Cress.¹
O. foraminatus Sauss.¹
Crabro 6-maculatus Say¹
Philanthus flavifrons Cress.¹
Eucerceris fulvipes Cress.¹

Coleoptera

Hylastes longus Lec.⁴
Scolytus 4-dentatus Say⁵
Pityogenes pondrosae Hopk.¹
Tomicus integer Eich.¹
Calandra oryzae Linn.⁵
Baris strenua Lec.⁵
Thysanocnemis helvolus Lec.⁵
T. fraxini Lec.⁵
Anthonomus squamosus Lec.¹
Tachypterus 4-gibbus Say⁵
Lixus macer Lec.⁵
Rhynchites hirtus Fabr.⁵
Epicauta corvina Lec.⁵
Crymodes discicollis Lec.¹
*C. exiguus*⁵
Bruchus fraterculus Horn¹
B. discoideus Say⁵
B. 4-maculatus Fabr.⁵
B. mimus Say¹
Spermophagus robiniae Sch.¹
Chelymorpha phytophagica Cr.⁵
Cassida pallidula Boh.⁵
C. ellipsis Lec.⁵
Diabrotica lemniscata Lec.⁴
Monocesta coryli Say⁴
Lina lapponica Linn.⁴
Colaspis favosa Say⁴
Paria viridicyanea Cr.⁴
Myochrous denticollis Say¹
Fidia longipes Melsh.⁴
Exema conspersa Mann.⁴
E. dispar Lec.⁵
Saxinis omogera Luc.⁴
Babia 4-guttata Oliv.⁴
Coscinoptera dominicana Fabr.⁴
C. axillaris Lec.⁴
Tetraopes canescens Lec.¹
T. femoratus Lec.¹
Dectes spinosus Say⁴

Plectrodera scalator Fabr.¹
Dorcaschema alternatum Say⁵
D. wildii Uhler⁵
Monohammus oregonensis Lec.¹
Monilema annulatum Say⁵
Leptura chrysocoma Kirby¹
Typocerus sinuatus Newm.⁵
Neoclytus muriculatus Kirby⁴
Cyllene decorus Oliv.⁴
Tragidion fulvipenne Say⁴
Rhopalophora longipes Say⁵
Eburia 4-geminata Say⁶
Callidium janthinum Lec.¹
Prionus imbricornis Linn.⁵
Euphoria kernii Hald.⁵
E. kernii var.⁵
E. kernii black var.⁵
E. areata Fabr.⁵
Dynastes titus Linn.⁴
Strigoderma arboricola Fabr.⁵
Polyphylla decemlineata Say¹
Bolboceras faretus Fabr.⁴
*Phanaeus palliatus*¹
Canthon praticola Lec.⁵
Hydnocera tabida Lec.⁴
H. subfasciata Lec.¹
Clerus sphegeus Fabr.⁴
C. nigriventris Lec.⁴
C. ichneumonaeus Fabr.⁵
C. spinolae Lec.⁵
Acmæodera pulchella Herbst.¹
Psiloptera drummondi Lap. & Gory.⁵
Gyascutus obliteratus Lec.¹
Limoniæ canus Lec.¹
Elatér apicatus Say¹
Cryptohypnus pectoralis Say¹
Plegaderus nitidus Horn¹
Hister instratus Lec.¹
Orphilus niger Rossi⁴

Dermestes fasciatus Lec.¹
Silvanus planatus Germ.¹
Languria laeta Lec.¹
Hyperaspis lateralis Muls.¹
Brachyacantha dentipes Fabr.⁴
Exochomus contristatus Muls.⁴
E. aethiops Bland.¹
Coccinella abdominalis Say⁴
C. annectans Cr.¹
C. monticola Muls.⁴
C. transversoguttata Fabr.¹

Hippodamia sinuata Muls.¹
Oilbrus vittatus Lec.¹
Homalium humerosum Faur.¹
Homalota lividipennis Manp.¹
Dineutes assimilis Aubc.⁵
Nothopus zabroides Lec.¹
Cymindis planipennis Lec.¹
Lebia atriceps Lec.¹
Anophthalmus horni Garman⁶
Tetracha virginica Linn.⁶

Diptera

Cistogaster immaculata Macq.⁴
Gymnosoma fuliginosa Desc.⁴
Xanthomelana arcuata Say⁴
Hemyda aurata Desc.⁴
Epigrimyia lucens Toen.⁴
Belvoisia bifasciata Fabr.⁴
B. unifasciata Desc.⁴
Ocyptera carolinae Desc.⁴
O. dosiades Walk.⁴
Linnaemyia comta Fall.⁴
Blepharipeza adusta Locic.⁴
Hilarella polita Toen.⁴
Gonia capitata DeG.⁴
Spallanzania hebes Fall.⁴
S. hesperidarum Will.⁴
Tricophora ruficauda c.d. W.⁴
Peleteria robusta Wied.⁴
Archytas analis Fabr.⁴
A. aterrima Desc.⁴
A. hystrix Wied.⁴
A. lateralis Macq.⁴

Echinomyia algens Wied.⁴
E. decisa Walk.⁴
E. hystrix Will.⁴
Epalpus bicolor Will.⁴
E. signifera Will.⁴
Bombyliomyia abrupta Wied.⁴
Dejeania vexatrix O. S.⁴
Paradejeania rutilioides Jaen.⁴
Jurinella ambigua Macq.⁴
Syrphus arcutatus Fall.⁴
S. umbellatarum Schiner.⁴
Mesograpta marginata Say⁴
M. polita Say⁴
Rhingia nasica Say⁴
Heliophilus laetus Locic.⁴
Tropidia quadrata Say⁴
Spilomyia longicornis Loew.⁴
Chrysops callidus O. S.⁴
C. plangens Wied.⁴
Tabanus rhombicus O. S.⁴

LIST OF CULICIDAE FROM PROF. F. V. THEOBALD, ENGLAND

Myzomyia rossi Giles; India
Pyrethrophorus costalis Locic; West Africa
Myzorhynchus barbirostris c. d. Wulp.; Malay states
M. nigerimus Giles; India
M. sinensis Wied.; Malay states
Nyssorhynchus fuliginosus Giles; India
N. jamesii Theob.; India
N. maculata Theob.; India
N. masteri Skuse; Australia
Cella argyrotarsis Desc.; South Lucia
C. albipes Theob.; New Amsterdam

Janthinomyia lutzii Theob.; Rio de Janeiro
J. musica Say; Rio and New Amsterdam
Mucida alternans Westw.; Australia
Eretmapodites quinquevittata Theob.; Uganda
Desvoidea obturbans Walk.; India
D. panalectros Giles; India
Stegomyia fasciata Fabr.
S. scutellaris Walk.; Malay states
Scutomyia (Stegomyia) notoscripta Skuse; Australia and India
Theobaldia annulata Meig.; England

- T. incidens Thomson*; North America
T. spathipalpis Rondani; Madeira
Culex alboannulatus Macq.; Australia
C. annulioris Theob.; Transvaal
C. annulirostris Skuse; Australia and New Guinea
C. canadensis Theob.; Canada
C. cantans Meig.; Canada
C. concolor Dcsv.; India
C. confirmatus Arrib.; Rio de Janeiro
C. cylindricus Theob.; Australia
C. diversus Theob.; Europe
C. fatigans Wied.
C. gelidus Theob.; Malay states
C. luteolateralis Theob.; west and central Africa
C. mimeticus Noë; India and Malay states
C. occidentalis Skuse; Australia
C. ochraceus Theob.; central Africa
C. pulcriventer Giles; India
C. sylvestris Theob.; Canada
C. taeniorhynchus Wied.; Rio de Janeiro
C. tigripes Grandpré; Mauritius
C. viridiventer Giles; India
C. vittiger Skuse; Australia
Melaniconion atratus Theob.; Jamaica
Grabhamia pygmaeus Theob.; West Indies
G. vittata Theob.; New Mexico
Taeniorhynchus aurifer Theob.; Uganda
T. brevicellulus Theob.; Malay states
T. conopas Frau.; Malay states
T. fasciolatus Arrib.; British Guiana
T. fulvus Wied.; Para
Mansonina annulifera Theob.; India
M. annulipes Walk.; Malay states
M. titillans Walk.; British Guiana
M. uniformis Theob.; Malay states and Africa
Delnocerites cancer Theob.; West Indies and Uganda
Uranotaenia socialis Theob.; West Indies
Aedeomyia squammpenna Arrib.; Malay states
Phoniomyia longirostris Theob.; Trinidad
Sabethes remipes Wied.; Brazil
Limatus durhami Theob.; para
Trichoprosopon (Joblotia) nivipes Theob.; Trinidad

Lepidoptera

- Anaea andria Scud.*^a
Ceratomia catalpae Bdv.^a
*Eubaphe rubicundaria Hübn.*¹
*Arachnis picta, Pack.*¹
*Apantesis incorrupta Hy. Edw.*¹
*Parasemia plantaginis Linn.*¹
Laphygma frugiperda Sm. & Abb.^a
*Oncocnemis augustus Harr.*¹
Heliothis armiger Hübn.^a
Autographa brassicae Riley^a
*Syneda howlandii Grote*¹
*Homoptera rubi Hy. Edw.*¹
*Nycteola proteella Dyar*¹
*Hydriomena sp.*¹
*Triplocris smithsonianus Clem.*¹
*Loxostege sticticalis Linn.*¹
*L. commixtalis Walk.*¹
*L. coloradensis Gr. Rob.*¹
*Cornifrons similis Grote*¹
*Crambus teterrellus Zinck.*¹
*Thaumatopsis repanda Grote*¹
*Hulstia undulatella Clem.*¹
*Homocerosoma electellum Hulst.*¹
*Ethmia discostrigella Chamb.*¹

Neuroptera

- Raphidia oblita Hag.*¹
*Chrysopa externa Hag.*¹
*Brachynemurus nigrilabris Hag.*¹
*Platyphylax designata Walk.*¹

Hemiptera

Homaloporus congruus <i>Uhl.</i> ¹	Trigonotylus pulcher <i>Reut.</i> ¹
Perillus claudus <i>Say</i> ¹	Callimiris tarsalis <i>Reut.</i> ¹
Apateticus marginiventris <i>Stal.</i> ¹	Resthenia insignis <i>Say</i> ¹
Cosmopepla conspiciaris <i>Dallas</i> ¹	Lomatopleura caesar <i>Reut.</i> ¹
Carpocoris lynx <i>Fabr.</i> ¹	Hadronema militaris <i>Uhl.</i> ¹
Thyanta custator <i>Fabr.</i> ¹	Poeciloscytus ¹
T. rugulosa <i>Say</i> ¹	Systratiotus americanus <i>Reut.</i> ¹
Archimerus calcarator <i>Fabr.</i> ¹	Camptobrochis nebulosus <i>Uhl.</i> ¹
Catorhintha guttula <i>Fabr.</i> ¹	Capsus brachycorus <i>Uhl.</i> ¹
Ficana apicalis <i>Dallas</i> ¹	Pycnoderes 4-maculatus <i>Guer.</i> ¹
Alydus quinquespinosus <i>Say</i> ¹	Labops hesperius <i>Uhl.</i> ¹
A. pluto <i>Uhl.</i> ¹	Dicyphus californicus <i>Stal.</i> ¹
Darmistus subvittatus <i>Stal.</i> ¹	Orectoderus ¹
Scolopocerus secundarius <i>Uhl.</i> ¹	Anthocoris melanocerus <i>Reut.</i> ¹
Nysius minutus <i>Uhl.</i> ¹	Coriscus kalmii <i>Reut.</i> ¹
Orsillus scolopax <i>Say</i> ¹	Repipta taurus <i>Fabr.</i> ¹
Ischnodemus falcus <i>Say</i> ¹	Apiomerus pictipes <i>H. Sch.</i> ¹
Geocoris pallens <i>Stal.</i> ¹	A. ventralis <i>Say</i> ¹
Heraeus insignis <i>Uhl.</i> ¹	Ilygrotrechus remigis <i>Say</i> ¹
Pamera bilobata <i>Say</i> ¹	Limnotrechus marginatus <i>Say</i> ¹
Trapezonotus nebulosus <i>Fall.</i> ¹	Hebrus concinnus <i>Uhl.</i> ¹
Emblethis arenarius <i>Linn.</i> ¹	Cicada var. cassinii <i>Fish.</i> ²
Rhyparochromus floralis <i>Uhl.</i> ¹	Microvella ¹
Melanocoryphus bicrucis <i>Say</i> ¹	M. hornii <i>Uhl.</i> ¹
M. facetus <i>Say</i> ¹	Salda interstitialis <i>Say</i> ¹
M. admirabilis <i>Uhl.</i> ¹	S. pallipes <i>Fabr.</i> ¹
Lygaeus reclivatus <i>Say</i> ¹	Galgulus oculus <i>Fabr.</i> ¹
Largus cinctus <i>H. Sch.</i> ¹	Anisops platynemis <i>Fieb.</i> ¹
Dysdercus minus <i>Say</i> ¹	Corisa abdominalis <i>Say</i> ¹
D. albidiventris <i>Stal.</i> ¹	

Coccidae

Parlatoria pergandii <i>Comst.</i> ² on Japanese orange; Stanford University Cal.	C. obscurus <i>Comst.</i> ¹ on Quercus coccinea; Columbus O.
P. florinla ² ; Gifu-Ken, Japan	C. kelloggi <i>Kuw.</i> ² Chikujo-gun, Kiushiu, Japan
Lepidosaphes ulmi <i>Linn.</i> ² on apple; Stanford University Cal.	C. aurantii citrinus <i>Coq.</i> ² Mazatlan, Mexico
L. newsteadii tokionis <i>Kuw.</i> ² on Cordia; Tokyo, Japan	C. anidum <i>Linn.</i> ² on fern; Tokyo, Japan
L. gloverii <i>Pack.</i> ² on orange; Kiushiu, Japan	Pseudaonidia paeoniae <i>Ckll.</i> ² on Aescia; Hikosan, Kiushiu, Japan
L. crawii <i>Ckll.</i> ² Angio Saitama-Ken, Japan	Aspidiotus rapax <i>Comst.</i> ^{2,3} on laurel; Stanford University Cal.
Odonaspis secreta <i>Ckll.</i> ² on bamboo; Hikosan, Kiushiu, Japan	A. perniciosus <i>Comst.</i> ² on peach; Stanford University Cal.
Chrysomphalus rossi <i>Mask.</i> ² on Araucaria bidwillii; Stanford University Cal.	A. lataniae <i>Sign.</i> ² Tokyo, Japan
	A. hederæ <i>Vall.</i> ² on Sequoia sempervirens; Stanford University Cal.

- A. glanduliferus* *Ckll.*¹ on *Pinus sylvestris*; Columbus O.
A. coniferarum shastae *Cole*² on cypress; Lake co. Cal.
A. californicus *Cole*² on *Pinus ponderosa*; Cobb Mt, Lake co. Cal.
A. aesculi *Johns.*² on buckeye; San Mateo Cal.
Leucaspis kelloggi *Cole*² on *Abies concolor*; Mt Shasta Cal.
Pollaspis pini *Mask.*² on *Abies firma*; Tokyo, Japan
Aulacaspis rosae *Bouché*² on wild rose; Palo Alto Cal.
A. pentagona *Targ.*² on cherry, plum; Tokyo, Japan
A. crawli *Ckll.*² on Yumi; Tokyo, Japan
Epidiaspis pyricola *Del Quer.*² on prune; Miliken, Santa Clara co. Cal.
Diaspis bromeliae *Kern.*² on palm; San José Cal.
Chionaspis spartinae *Comst.*² on *Spartina stricta*; Palo Alto Cal.
C. salicis-nigrae *Walsh*² on *Salix cordata*; Columbus O.
C. quereus *Comst.*² on *Quercus chrysolepis*; Stevens creek, Mountain View Cal.
C. pinifoliae *Fitch*² on *Torreya californica*; Stevens creek, Mountain View Cal.
C. ortholobis *Comst.*² on dogwood; Mountain View Cal.
C. gleditsiae *Sand.*² on *Gleditsia tricanthos*; Columbus O.
C. americana *Johns.*² on *Ulmus americana*; Columbus O.
Aclerda tokionis *Ckll.*²; Tokyo, Japan
A. californica *Ehrh.*² on bunch grass; Mountain View Cal.
Physokermes insignicola *Craw.*² on *Pinus radiata*; San Mateo Cal.
Saissetia oleae *Bern.*^{2,2} on vine; San Mateo Cal.
Eulecanium quercitrionis kermoides *Tyr.*² on *Quercus agrifolia*; Mountain View Cal.
E. armeniacum *Craw.*² on prune; Stanford University Cal.
E. adenostomae *Kuic.*² on *Adenostoma fasciculatum*; Black Mt Cal.
Coccus hesperidum *Linn.*^{2,2} on rose; Arcata Cal.
Eucalymnatus tessellatus *Sign.*² on fern; San Francisco Cal.
Ceroplastes ceriferus *And.*² on tea
Pulvinaria rhois *Ehrh.*² on *Rhus diversiloba*; near Mountain View Cal.
P. aurantii *Ckll.*² on tea; Kokura, Kiushiu, Japan
Pseudococcus pseudonipae *Ckll.*² on palm; San Francisco Cal.
*Phenacoccus dubia*² on *Diospyros kaki*; Kusatsu, Shiga-Ken, Japan
Dactylopius dudleyi *Cole.*² on *Cupressus macnabiana*; Shasta Cal.
D. sp. *Cog.*² on cypress; Del Monte Cal.
Eriococcus graminis *Mask.*² on bamboo; Gifu-Ken, Japan.
E. artemisiae *Kuic.*² on *Artemisia californica*; Santa Clara county Cal.
E. araucariae *Mask.*² on *Araucaria excelsa*; Berkley Cal.
E. adenostomae *Ehrh.*² on *Adenostoma fasciculatum*; Black Mt Cal.
Gossyparia spuria *Modecr.*² on elm; Stanford University Cal.
Cerococcus quercus *Comst.*² on oak; Mountain View Cal.
C. ehrhorni *Ckll.*^{2,2} on live oak; Mountain View Cal.
Lecaniodiaspis quereus *Ckll.*² on oak
Asterolecanium quercicola *Bouché*² on *Quercus lobata*, Stanford University Cal.
Icerya purchasi *Mask.*² on Scotch broom; Stanford University Cal.

Orthoptera

<i>Hypochlora alba</i> Dodge ¹	<i>M. flavidus</i> Scud. ¹
<i>Campylacantha olivaceae</i> Scud. ¹	<i>M. flabellatus</i> Scud. ¹
<i>Hesperottetix viridis</i> Thos. ¹	<i>M. packardii</i> Scud. ¹
<i>H. pratensis</i> Scud. ¹	<i>M. minor</i> Scud. ¹
<i>H. speciosus</i> Scud. ¹	<i>M. luridus</i> Dodge ¹
<i>Aeoloplus regalis</i> Dodge ¹	<i>M. bivittatus</i> Say ¹
<i>Podisma dodgeli</i> Thos. ¹	<i>Phoetaliotes nebrascensis</i> (nebrascensis) Thom. ¹
<i>Melanoplus lakinus</i> Scud. ¹	<i>P. nebrascensis</i> (volucris) Dodge ¹
<i>M. differentialis</i> Thos. ¹	<i>Schistocerca americana</i> Drury ⁶
<i>M. flabellifer</i> Scud. ¹	
<i>M. bowditchi</i> Scud. ¹	

Plecoptera

<i>Perla ephyre</i> Newm. ⁴	<i>P. xanthenes</i> Say ⁴
<i>P. lurida</i> Hag. ⁴	

EXCHANGE LIST

The following is a partial list of the species of insects in the New York State Museum which are available for exchange purposes. In return we are specially desirous, as above stated, of securing specimens of economic importance in different sections of this country and of foreign countries, and particularly of forms likely to become destructive if established in this State.

Hymenoptera

<i>Bombus fervidus</i> Fabr.	<i>Apanteles congregatus</i> Say
<i>B. ternarius</i> Say	<i>Iampronota americana</i> Cress.
<i>B. terricola</i> Kirby	<i>Pimpla conquisitor</i> Say
<i>B. vagans</i> Smith	<i>P. inquisitor</i> Say
<i>Xylocopa virginica</i> Drury	<i>Theronia fulvescens</i> Cress.
<i>Megachile latimanus</i> Say	<i>Ephialtes irritator</i> Fabr.
<i>Andrena vicina</i> Smith	<i>Thalessa lunator</i> Fabr.
<i>Vespa arenaria</i> Fabr.	<i>Paniscus geminatus</i> Say
<i>V. consobrinus</i> Sauss.	<i>Anomalon exile</i> Prov.
<i>V. diabolica</i> Sauss.	<i>Ichneumon centrator</i> Say
<i>V. maculata</i> L.	<i>I. cineticornis</i> Cress.
<i>Polistes pallipes</i> St Farg.	<i>I. confirmatus</i> Cress.
<i>Odynerus capra</i> Sauss.	<i>I. scelestus</i> Cress.
<i>Philanthus solivagus</i> Say	<i>I. unifasciatus</i> Say
<i>Monedula ventralis</i> Say	<i>I. laetus</i> Brullé
<i>Bembex fasciata</i> Fabr.	<i>Tremex columba</i> Linn.
<i>Chalybion caeruleum</i> Linn.	<i>Allantus basillaris</i> Say
<i>Pelopoeus cementarius</i> Drury	<i>Dolerus arvensis</i> Say
<i>Ammophila communis</i> Cress.	<i>D. sericeus</i> Say
<i>Aporus biguttatus</i> Fabr.	<i>Lygaeonematus erichsonii</i> Hartig
<i>A. marginatus</i> Say	<i>Trichocampus viminalis</i> Fallen
<i>Pelecinus polyturator</i> Drury	<i>Cimbex americana</i> Leach

Coleoptera

- Cratoparis lunatus Fabr.*
Tomicus calligraphus Germ.
T. cacocephalus Lec.
T. pini Say
T. balsameus Lec.
Xyleborus celsus Eich.
X. dispar Fabr.
Cossonus platanea Say
Calandra granaria Linn.
Balaninus nasicus Say
Mononychus vulpeculus Fabr.
Cryptorhynchus lapathi Linn.
Conotrachelus nenuphar Hbst.
Gymnetron teter Fabr.
Tachypterus quadrigibbus Say
Magdalis armicollis Say
M. barbata Say
M. perforata Horn
Lixus concavus Say
Hyllobius pales Hbst.
Pissodes strobi Peck
Phytonomus nigrirostris Fabr.
P. punctatus Fabr.
Cyphomimus dorsalis Horn
Pandeletejus hilaris Hbst.
Otiorhynchus ovatus Linn.
Rhynchites bicolor Fabr.
Epicauta vittata Fabr.
E. cinerea Forst.
E. pennsylvanica DeG.
Macrobasis unicolor Kirby
Henous confertus Say
Meloe angusticollis Say
Notoxus anchora Hentz.
N. bifasciatus Lec.
Mordella marginata Melsh.
Anaspis flavipennis Hald.
Nacerdes melanura Linn.
Pytho americanus Kirby
Melandrya striata Say
Cistela sericea Say
Boletotherus bifurcus Fabr.
Hoplocephala bicornis Oliv.
Diaperis hydni Fabr.
Paratenetus punctatus Sol.
Tripholium ferrugineum Fabr.
Tenebrio tenebrioides Beauv.
T. molitor Linn.
Xylopinus saperdioides Oliv.
- Scotobates calcaratus Fabr.*
Merinus laevis Oliv.
Iphthimus opacus Lec.
Nyctobates pennsylvanica DeG.
Eleodes tricostrata Say
Bruchus obtectus Say
Chelymorpha argus Licht.
Coptocycla aurichalcea Fabr.
Odontota rubra Web.
Microrhopala vittata Fabr.
Dibolia borealis Chev.
Phyllotreta sinuata Steph.
Systema hudsonias Forst.
S. frontalis Fabr.
S. bitaeniata Lec.
Crepidodera rufipes Linn.
C. helxines Linn.
C. cucumeris Harr.
Haltica bimarginata Say
Disonychia alternata Ill.
D. pennsylvanica Ill.
D. collaris Fabr.
Galerucella decora Say
G. luteola Müll.
Trirhabda canadensis Kirby
Diabrotica 12-punctata Oliv.
D. vittata Fabr.
Ceratomyxa caminea Fabr.
Lina scripta Fabr.
Gastroidea polygoni Linn.
Chrysomela similis Rog.
C. elegans Oliv.
C. bigsbyana Kirby
Doryphora clivicollis Kirby
D. 10-lineata Say
Prasocuris varipes Lec.
Nodonota brunnea Fabr.
N. tristis Oliv.
Graphops pubescens Melsh.
Metachroma marginalis Cr.
Typophorus aterrima Oliv.
Chrysocelus auratus Fabr.
Glyptoscelus pubescens Fabr.
Fidia viticida Walsh
Xanthonia 10-notata Say
Monachus saponatus Fabr.
Chlamys plicata Fabr.
Babia 4-guttata Oliv.
Crioceris asparagi Linn.

C. 12-punctata Linn.
Lema trilineata Oliv.
Syneta ferruginea Germ.
Orsodachna atra Ahr.
Donacia cincticornis Newm.
D. rufa Say
Tetraopes tetraophthalmus Forst.
Saperda tridentata Oliv.
Liopus alpha Say
Monohammus maculosus Hald.
M. scutellatus Say
M. confusus Kirby
Leptura lineola Say
L. exigua Newm.
L. cordifera Oliv.
L. canadensis Fabr.
L. rubrica Say
L. vagans Oliv.
L. proxima Say
L. vittata Germ.
Typocerus velutinus Oliv.
Strangalia acuminata Oliv.
Rhagium lineatum Oliv.
Desmocerus palliatus Forst.
Eudercus picipes Fabr.
Clytanthus ruricola Oliv.
Neoclytus erythrocephalus Fabr.
Xylotrechus colonus Fabr.
Cyllene robiniae Forst.
Molorchus bimaculatus Say
Elaphidion villosum Fabr.
Callidium antennatum Newm.
Prionus laticollis Drury
Orthosoma brunneum Forst.
Parandra brunnea Fabr.
Trichius affinis Gory
Osmoderma scabra Beauv.
O. eremicola Knoch.
Euphoria inda Linn.
Chalepus trachypygus Burm.
Pelidnota punctata Linn.
Strigoderma arboricola Fabr.
Anomala lucicola Fabr.
Lachnosterna fusca Froh.
L. tristis Fabr.
Macroductylus subspinosus Fabr.
Serica trociformis Burm.
Dichelonycha elongata Fabr.
D. albicollis Burm.
Hoplia modesta Hald.

Geotrupes splendidus Fabr.
Bolboceras farcus Fabr.
Aphodius fossor Linn.
A. fimetarius Linn.
A. granarius Linn.
A. inquinatus Hbst.
Onthophagus pennsylvanicus Harold
O. hecate Panz.
Phanaeus carnifex Linn.
Copris anaglypticus Say
Canthon laevis Drury
Passalus cornutus Fabr.
Ceruchus piceus Web.
Dorcus parallelus Say
Ennearthron thoracicornis Zeigl.
Lyctus opaculus Lec.
Sitodrepa panicea Linn.
Ptinus quadrimaculatus Melsh.
Clerus quadriguttatus Oliv.
C. nigriventris Lec.
C. analis Lec.
Trichodes nuttali Kirby
Telephorus carolinus Fabr.
T. scitulus Say
T. rotundicollis Say
T. bilineatus Say
Podabrus rugulosus Lec.
Chauliognathus pennsylvanicus DeG.
C. marginatus Fabr.
Photuris pennsylvanicus DeG.
Photinus scintillans Say
Pyropyga nigricans Say
Ellychnia corrusca Linn.
Lucidota atra Fabr.
Calopteron reticulatum Fabr.
Brachys ovata Web.
Agrilus anxius Gory
A. ruficollis Fabr.
Acmeodera pulchella Hbst.
Chrysobothris femorata Fabr.
C. floricola Gory
C. dentipes Germ.
C. scabripennis Lap. & Gory
C. pusilla Lap. & Gory.
Buprestis maculiventris Say
Dicerca divaricata Say
Chalcophora virginienis Drury
Asaphes decoloratus Say
Oxygonus obesus Say
Corymbites inflatus Say

- C. cylindriciformis* *Hbst.*
Limonius confusus *Lec.*
Melanotus communis *Gyll.*
Dolopius lateralis *Esch.*
Elater nigricollis *Hbst.*
E. obliquus *Say*
Cryptohypnus planatus *Lec.*
Alaus oculatus *Linn.*
Tharops ruficornis *Say*
Tenebrioides corticalis *Melsh.*
Ips quadriguttatus *Fabr.*
Omosita colon *Linn.*
Nitidula bipustulata *Linn.*
Conotelus obscurus *Er.*
Colastus truncatus *Rand.*
Hister parallelus *Say*
Anthrenus scrophulariae *Linn.*
A. verbasci *Linn.*
Attagenus piceus *Oliv.*
Dermestes lardarius *Linn.*
Byturus unicolor *Say*
Triphyllus humeralis *Kirby*
Mycetophagus punctatus *Say*
M. flexuosus *Say*
Silvanus surinamensis *Linn.*
Tritona thoracica *Say*
T. humeralis *Fabr.*
Lycoperdina ferruginea *Lec.*
Epilachna borealis *Fabr.*
Brachyacantha ursina *Fabr.*
Chilocorus bivulnerus *Muls.*
Psyllobora 20-maculata *Say*
Anatis ocellata *Linn.*
Adalia bipunctata *Linn.*
Coccinella trifasciata *Linn.*
C. 9-notata *Hbst.*
C. transversalis *Muls.*
C. sanguinea *Linn.*
Hippodamia 13-punctata *Linn.*
H. parenthesis *Say*
Megilla maculata *DeG.*
Tachinus fimbriatus *Grav.*
Stenus flavicornis *Er.*
Paederus littorarius *Grav.*
Philonthus aeneus *Rossi*
Staphylinus cinnamopterus *Grav.*
S. maculosus *Grav.*
Creophilus villosus *Grav.*
Listrophus cingulatus *Grav.*
Silpha surinamensis *Fabr.*
S. lapponica *Hbst.*
S. inaequalis *Fabr.*
S. noveboracensis *Forst.*
S. americana *Linn.*
Necrophorus marginatus *Fabr.*
N. pustulatus *Hersch.*
N. tomentosus *Web.*
Sphaeridium scarabaeoides *Linn.*
Hydrobius fuscipes *Linn.*
H. globosus *Say*
Hydrocharis obtusatus *Say*
Hydrophilus triangularis *Say*
H. glaber *Hbst.*
Dineutes assimilis *Aube.*
Gyrinus ventralis *Kirby*
G. picipes *Aube.*
Aeilus semisulcatus *Aube.*
Dytiscus fasciventris *Say*
Colymbetes sculptilis *Harr.*
Agabus punctulatus *Aube.*
Hyblus biguttatus *Germ.*
Deroneetes griseostriatus *DeG.*
Laccophilus maculosus *Germ.*
Cnemidolus 12-punctatus *Say*
Anisodactylus rusticus *Say*
A. discoideus *Dej.*
A. interstitialis *Say*
Bradycellus rupestris *Say*
Harpalus erraticus *Say*
H. viridiaeneus *Beaur.*
H. caliginosus *Fabr.*
H. pennsylvanicus *DeG.*
H. herbivagus *Say*
Agonoderus pallipes *Fabr.*
Chlaenius sericeus *Forst.*
C. tricolor *Dej.*
C. pennsylvanicus *Say*
C. tomentosus *Say*
Lebia grandis *Hentz*
L. viridis *Say*
Galerita janus *Fabr.*
Calathus gregarius *Say*
Dicaelus elongatus *Bon.*
Amara impuncticollis *Say*
Pterostichus stygius *Say*
P. lucublandus *Say*
P. corvinus *Dej.*
P. patruelis *Dej.*
P. femoralis *Kirby*
Tachys nanus *Gyll.*

Bembidium quadrimaculatum Linn.
Scarites subterraneus Fabr.
Pasimachus elongatus Lec.
Nebria sahlbergi Fisch.
Elaphrus ruscarius Say
Calosoma calidum Fabr.
Carabus vinctus Web.
Omophron americanum Dej.

Cicindela lecontei Hald.
C. sexguttata Fabr.
C. generosa Dej.
C. vulgaris Say
C. repanda Dej.
C. purpurea Oliv.
C. 12-guttata Dej.
C. punctulata Fabr.

Diptera

Physocephala furcillata Will.
Drosophila ampelophila Loew.
Chloropisca variceps Loew.
Piophilha casei Linn.
Lauxania flaviceps Loew.
Trypeta longipennis Wied.
Rhagoletis cingulata Loew.
Phorbia fusciceps Rondani
Pollenia rudis Fabr.
Belvoisia unifasciata Desv.
Ocyptera carolinae Desv.
Tachina mella Walk.
Echinomyia algens Wied.
Gonia capitata DeG.
Archytas analis Fabr.
Spilomyia fusca Loew.
Syrirta pipiens Linn.
Helophilus similis Macq.
Eristalis dimidiatus Wied.

E. tenax Linn.
E. transversus Wied.
Rhingia nasica Say
Sphaerophoria cylindrica Say
Mesograpta marginata Say
Syrphus lesueurii Macq.
S. ribesii Linn.
S. americanus Wied.
Platycherus quadratus Say
Tabanus atrata Fabr.
T. reinwardtii Wied.
T. ilneola Fabr.
Therioptectes microcephalus O. S.
Chrysops vittatus Wied.
C. excitans Walk.
C. niger Macq.
Pangonia tranquilla O. S.
Biblio albipennis Linn.

Lepidoptera

Papilio glaucus turnus Linn.
Pontia rapae Linn.
Eurymus philodice Godt.
Argynnis aphrodite Fabr.
A. atlantis Edw.
Brenthis myrina Cram.
B. bellona Fabr.
Phyciodes tharos Dru.
Eugonia j-album Boisd.
Eu Vanessa antiopa Linn.
Vanessa atalanta Linn.
Basilarchia arthemis Dru.
B. archippus Cram.
Anosia plexippus Linn.
Fenisea tarquinius Fabr.
Heodes hypophleas Boisd.
Samia cecropia Linn.
Callosamia promethia Dru.
Lycomorpha pholus Dru.

Ctenucha virginica Charp.
Eubaphe aurantiaca Hub.
Haploa confusa Lyman
Estigmene acrea Dru.
Isia isabella Sm. & Abb.
Diacrisia virginica Fabr.
Apantes virgo Linn.
A. parthenice Stretch.
Halisidota tessellaris Sm. & Abb.
H. caryae Harr.
Alypia octomaculata Fabr.
Hadena passer Guen.
H. dubitans Walk.
H. devastatrix Bracc.
H. arctica Boisd.
Pyrophila pyramidoides Guen.
Adelphagrotis prasina Fabr.
Peridroma margaritosa Harr.
Noctua smithii Snell.

N. bicarnea Guen.
N. c-nigrum Linn.
N. clandestina Harr.
Feltia subgothica Haw.
F. jaculifera Guen.
Paragrotis redimicula Morr.
Mamestra purpurissata Grote
M. meditata Grote
M. renigera Steph.
M. olivacea Morr.
Nephelodes minians Guen.
Heliothilla unipuncta Haw.
H. luteopallens Smith
Tricholita signata Streck.
Gortyna nictitans Bork.
Orthosia helva Grote
Plusia aerea Hübn.
P. aeroides Grote

Autographa bimaculata Steph.
A. precatlonis Guen.
A. brassicae Riley
A. rectangula Kirby
A. u-aureum Guen.
A. falcigera Kirby
Eustrotia carneola Guen.
Notolophus badia Hy. Edw.
Hemerocampa leucostigma Abb. & Sm.
Eudule mendica Walk.
Cingilla catenaria Dru.
Sabulodes transversata Dru.
Sesia tipulliformis Clerck.
Desmia funeralis Hübn.
Evergestis straminealis Hübn.
Tholeria reversalis Guen.

Trichoptera

Leptocerus resurgens Walk.
Hydropsyche scalaris Hag.
Ilaesus guttifer Walk.

Goniotaulius dispectus Walk.
Neuronia postica Walk.

Mecoptera

Panorpa rufescens Rambur
P. maculosa Hag.

Bittacus strigosus Hag.

Neuroptera

Polystoechotes punctatus Fabr.

Corydalis cornuta Linn.

Hemiptera

Canthophorus cinctus Beauv.
Podisus maculiventris Say
P. placidus Uhler
Brochymena 4-pustulata Fabr.
Cosmopepla carnifex Fabr.
Euschistus servus Say
E. tristigmus Say
E. fissilis Uhler
E. variolarius P. B.
Coenus delius Say
Pentatoma juniperana Linn.
Murgantia histrionica Hahn.
Nezara hiliaris Say
Anasa tristis DeG.
Alydus eurinus Say
Leptocoris trivittatus Say
Blissus leucopterus Say

Lygaeus turcicus Fabr.
Leptopterna dolabrata Linn.
Calocoris rapidus Say
Lygus pratensis Linn.
Poecilopsus lineatus Fabr.
Capsus ater Linn.
Piesma cinerea Say
Corythuca arcuata Say
Phymata wolffii Her. Sch.
Nabis rufusculus Reut.
Acholla multispinosa DeG.
Limnotrechus marginatus Say
Belostoma americana Leid.
Notonecta undulata Say
Cicada tibicen Linn.
C. septendecim Linn.
Publilia concava Say

<i>P. bicinctus</i> <i>Godg.</i>	<i>A. quadrangularis</i> <i>Say</i>
<i>Ceresa bubalus</i> <i>Fabr.</i>	<i>Clastoptera proteus</i> <i>Fitch</i>
<i>C. diceros</i> <i>Say</i>	<i>Diedrocephala mollipes</i> <i>Say</i>
<i>Stictocephala inermis</i> <i>Fabr.</i>	<i>D. coccinea</i> <i>Forst.</i>
<i>Smilla camelus</i> <i>Fabr.</i>	<i>D. noveboracensis</i> <i>Fitch</i>
<i>Telamona ampelopsisidis</i> <i>Harr.</i>	<i>Helochara communis</i> <i>Fitch</i>
<i>Enchenopa binotata</i> <i>Say</i>	<i>Thamnotettix clitellarius</i> <i>Say</i>
<i>Ormenis pruinosa</i> <i>Say</i>	<i>Empoasca rosae</i> <i>Harr.</i>
<i>Aphrophora saratogensis</i> <i>Fitch</i>	<i>Trioza tripunctata</i> <i>Fitch</i>

Coccidae

<i>Lepidosaphes ulmi</i> <i>Linn.</i>	<i>Chionaspis furfura</i> <i>Fitch</i>
<i>Aspidiotus perniciosus</i> <i>Comst.</i>	<i>C. euonymi</i> <i>Comst.</i>
<i>A. ostreaeformis</i> <i>Curt.</i>	<i>C. americana</i> <i>Johns.</i>
<i>A. ancylus</i> <i>Putn.</i>	<i>Eulecanium nigrofasciatum</i> <i>Perg.</i>
<i>A. abietis</i> <i>Schr.</i>	<i>Pulvinaria innumerabilis</i> <i>Rathr.</i>
<i>Aulacaspis rosae</i> <i>Bouché</i>	<i>Gossyparia spuria</i> <i>Modeer</i>
<i>Diaspis boisduvalii</i> <i>Sign.</i>	<i>Kermes galliformis</i> <i>Riley</i>

CONTRIBUTIONS TO COLLECTION OCT. 16, 1902-OCT. 15, 1903

Hymenoptera

- Bombus vagans* Smith, adult, July 24, C. R. Pettis, Saranac Inn N.Y.
Melissodes sphaeralceae Ckll., adult, Sep. 10, T. D. A. Cockerell, Pecos N.M.
Megachile cleomi? Ckll., adult, Sep. 10, T. D. A. Cockerell, Pecos N.M.
M. sapelloni? Ckll., adult, Sep. 10, T. D. A. Cockerell, Pecos N.M.
M. monardarum Ckll., adult, Sep. 10, T. D. A. Cockerell, Pecos N.M.
Perdita stotteri Ckll., adult, Sep. 10, T. D. A. Cockerell, Pecos N.M.
Camponotus herculeanus Linn., adult, May 21, F. R. Calkins, Ossining N.Y.
C. var. pennsylvanicus DeG. large black ant, work on balsam, Oct. 31, Jonas H. Brooks, Albany N.Y.
Pteromalus puparum Linn., adult, from *Euvanesa antiopa* Linn., Feb. 8, J. H. Cook, Albany N.Y.
Biorhiza forticornis Walsh, oak fig gall on oak, Aug. 24, C. H. Peck, Albany N.Y.
Urocerus tricolor Prov., adult, July 18, James Roy & Co., Troy N.Y.
Dolerus arvensis Say, adult, Ap. 30, F. R. Calkins, Ossining N.Y.
Emphytus cinctipes Nort., July 11, C. J. Locke, Ogdensburg N.Y.

Coleoptera

- Phytonomus nigrirostris* Fabr., adult, on clover, Mar. 25, F. R. Calkins, Ossining N.Y.
Mycetochares binotata Say, adult, July 11, C. J. Locke, Ogdensburg N.Y.

Spermophagus robiniae Sch., adult, June 6, **Reinlein Gasoline Torch Co.**, Mt Vernon Ill.

Chelymorpha argus Licht., argus beetle, adult, June 6, **C. J. Locke**, Ogdensburg N.Y.

Coptocycla bicolor Fabr., golden tortoise beetle, adult on peach leaves, May 30, **Emma S. Thomas**, Schoharie N.Y. Same, adult, June 6, **C. J. Locke**, Ogdensburg N.Y.

Galerucella luteola Müll., elm leaf beetle, adult on elm, May 25, **F. B. Calkins**, Ossining N.Y. Same, eggs and larvae on elm, July 13, **F. B. Calkins**, Ossining N.Y.

Diabrotica vittata Fabr., adult on squash, May 25, **F. B. Calkins**, Ossining N.Y.

Chrysomela bigsbyana Kirby, adult, June 25, **C. J. Locke**, Ogdensburg N.Y.

Doryphora elivicollis Kirby, adult, July 11, **C. J. Locke**, Ogdensburg N.Y.

Chrysochus auratus Fabr., golden gilt beetle, adults on dogbane, July 16, **J. Jay Barden**, Dansville N.Y. Same, adult, July 24, **C. B. Pettis**, Saranac Inn N.Y.

Diabrotica vittata Fabr., striped cucumber beetle, adult, June 25, **C. J. Locke**, Ogdensburg N.Y.

Crioceris 12-punctata Linn., 12-spotted asparagus beetle, adult, June 3, **C. H. Peck**, Menands N.Y.

C. asparagi Linn., asparagus beetle, adult on asparagus, May 25, **C. L. Williams**, Glens Falls N.Y. Same, adult on asparagus Sep. 3, **W. F. Greene**, Mt Vernon N.Y.

Tetraopes tetraophthalmus Forst., adult, July 11, **C. J. Locke**, Ogdensburg N.Y.

Oberca bimaculata Oliv., raspberry cane girdler work on raspberry canes, June 24, **John U. Metz**, Swormville N.Y.

Centrodera decolorata Harr., adult on butternut, Jan. 5, **G. S. Graves**, Newport N.Y.

Desmocerus palliatus Forst., adult, June 25, **C. J. Locke**, Ogdensburg N.Y.

Cyllene robiniae Forst., locust borer, Oct. 18, **W. C. Hitchcock**, Pittstown N.Y. Same, larvae on locust, June 16, **M. T. Richardson**, Brooklyn N.Y.

Prionus laticollis Drury, broad-necked *Prionus*, adult, July 20, **Miss M. J. Tyers**, Dobbs Ferry N.Y.

Ligyrus gibbosus DeG. adult, June 6, **Reinlein Gasoline Torch Co.**, Mt Vernon Ill.

Pelidnota punctata Linn., spotted grapevine beetle, Oct. 18, **W. C. Hitchcock**, Pittstown N.Y.

Lachnosterna fusca Fröhl., larva, June 25, **C. J. Locke**, Ogdensburg N.Y.

Diplotaxis liberta Germ., adults on peach, Sep. 24, **J. B. Crandall**, Hauppauge N.Y.

Macroductylus subspinosus Fabr., rose beetle, adult on fruit trees, June 16, **H. A. Jordan**, Cossackie N.Y.

Dichelonycha elongata Fabr., adult, June 6, **C. J. Locke**, Ogdensburg N.Y.

Lyctus parallelipipedus Melsh., adults in ash, July 10, **Joseph P. McHugh & Co.**, New York.

Collops vittatus Say, adult, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Telephorus carolinus Fabr., adult, June 25, **C. J. Locke**, Ogdensburg N.Y.

Podabrus rugulosus Lec., adult, June 25, **C. J. Locke**, Ogdensburg N.Y. Same, adult, July 11, **C. J. Locke**, Ogdensburg N.Y.

Lampyrid, larva, June 12, **George S. Graves**, Newport N.Y.

Chalcophora virginiensis Drury, adults, Oct. 18, **W. C. Hitchcock**, Pittstown N.Y.

Melanotus communis Gyll., adult, July 11, **C. J. Locke**, Ogdensburg N.Y.

Dolopius lateralis Esch., adult, July 11, **C. J. Locke**, Ogdensburg N.Y.

Alaus oculatus Linn., owl beetle, adult, July 9, **C. L. Daggett**, Albany N.Y. Same, adults, July 27, **Fred G. Carnes**, W. Chazy N.Y.

Anthrenus verbasci Linn., adult, May 25, **F. R. Calkins**, Ossining N.Y.

Chilocorus bivulnerus Muls., twice-stabbed ladybeetle, adult (feeding on San José scale) June 13, **Mr Hotchkiss**, Binghamton N.Y.

Adalia bipunctata Linn., two-spotted lady beetle, adult, July 31, **George S. Graves**, Newport N.Y. Same on Norway maple, June 12, **M. F. Tiger**, Patchogue N.Y. Same, larvae on rose, June 3, **Mrs A. G. Dana**, Far Rockaway N.Y.

Coccinella transversalis Muls., adult, July 24, **C. R. Pettis**, Saranac Inn N.Y.

C. 9-notata Herbst, adult, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Hydrophilus triangularis Say, adult, June 16, **Frances McCarty**, Albany N.Y.

Harpalus erraticus Say, adult, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Agonoderus pallipes Fabr., adult, May 21, **F. R. Calkins**, Ossining N.Y.

Pterostichus lucublandus Say, adult, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Cicindela punctulata Fabr., adult, July 6, **Richard Lohrmann**, Herkimer N.Y.

C. repanda Dej., adult, June 25, **C. J. Locke**, Ogdensburg N.Y.

C. vulgaris Say, adult, July 24, **C. R. Pettis**, Saranac Inn N.Y.

C. generosa Dej., adult, July 6, **Richard Lohrmann**, Herkimer N.Y.

C. 6-guttata Fabr., adult, June 25, **C. J. Locke**, Ogdensburg N.Y.

Siphonaptera

Ceratopsyllus serraticeps, cat flea, adult, infesting house, Sep. 14, **Otis Arnold**, Albany N.Y.

Diptera

Mosquito, larvae and adults, July 11, **C. J. Locke**, Ogdensburg N.Y.

Psorophora ciliata Fabr., adult, Aug. 6, **H. C. Weeks**, Sheepshead Bay, Brooklyn N.Y.

Chironomids, adult, Ap. 30, **F. R. Calkins**, Ossining N.Y.

Lasioptera vitis? O. S., June 4, **Francesco Landini**, New York.

Therioptetes affinis adult, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Tabanus atratus Fabr., mourning horsefly, adult, July 7, **Abraham Knechtel**, Albany N.Y.

Syrphus ribesii Linn., adult, Ap. 30, **F. R. Calkins**, Ossining N.Y.

Stratiomyid, adult, May 25, **C. L. Williams**, Glens Falls N.Y.

Tachinid sp., puparium infesting stalk borer, July 15, **C. L. Williams**, Glens Falls N.Y.

Pollenia rudis Fabr., cluster fly, adults in house, Sep. 1, **K. B. Christman**, Burtonville N.Y.

Phorbia brassicae Bouché, cabbage root maggot, larvae in turnips, Nov. 18, **J. J. Cormot**, Phoenix R.I.

P. ceparum Meigen, onion maggot, grubs on onions, June 19, **Mr VanDerzee**, Kenwood N.Y. Same, Mar. 25, **F. R. Calkins**, Ossining N.Y.

Trypeta longipennis Weid., adult, on Helianthus, July 31, **George S. Graves**, Newport N.Y.

Lepidoptera

Papilio polyxenes Fabr., adult, Feb. 11, **E. K. Colville**, Kenwood N.Y. Same, larva, June 16, **Mrs Humphrey**, Watervliet N.Y.

Pieris oleracea Harr., cabbage butterfly, adult, July 14, **Carl Heiser**, Malone N.Y.

Basilarchia arthemis Dr. banded purple, adult, June 17, **Mrs A. M. A. Jackson**, Camillus N.Y.

Sphecodina abbotii Swains, Oct. 18, **W. C. Hitchcock**, Pittstown N.Y.

Samia cecropia Linn., cecropia moth, adult eggs, June 12, **A. Saunders**, Ridge road, Irondequoit N.Y.

Telea polyphemus Cramer, egg and cocoon, June 6, **C. J. Locke**, Ogdensburg N.Y.

Ctenucha virginica Charp., adult, June 25, **C. J. Locke**, Ogdensburg N.Y.

Estigmene acraea Dr. salt marsh caterpillar, adult, June 9, **George S. Graves**, Newport N.Y.

Alypia octomaculata Fabr., 8-spotted forester, larvae on virginia creeper, July 26, **Percy MacG. Allen**, Albany N.Y.

Noctua clandestina Harr., adult, June 25, **C. J. Locke**, Ogdensburg N.Y.

Feltia subgothica? Haworth, larva on cabbage, June 25, **C. J. Locke**, Ogdensburg N.Y.

Mamestra picta Harr., zebra caterpillar, larva on strawberry, June 9, **C. L. Williams**, Glens Falls N.Y.

Heliophila pseudargyria Guenée, adults, May 21, **F. R. Calkins**, Ossining N.Y.

Xylina laticinerea? Grote, larva on peach, May 28, **Henry G. Parsons**, Milton N.Y.

Heliothis Armiger Hübn., corn worm, larva on corn, Aug. 25, **Dr M. W. VanDenburg**, Mt Vernon N.Y.

Heterocampa bilineata Pack., larvae on beech, July 12, **E. H. Mairs**, Irvington N.Y.

Notolophus antiqua Linn., larva, June 25, C. J. Locke, Ogdensburg N.Y.

Tolyte velleda? Stoll, lappet moth, larva on apple, June 13, Mr Hotchkiss, Binghamton N.Y.

Hydria undulata Linn., on cherry, Aug. 15, C. R. Pettis, Saranac Inn N.Y.

Prionoxystus ? *robiniae* Peck, larvae on beech. Jan. 5, George S. Graves, Newport N.Y.

Sanninoidea exitiosa Say, Oct. 18, W. C. Hitchcock, Pittstown N.Y.

Sesia acerni Clem., maple sesian, larva on maple, Sep. 18 W. C. H., Hartley Hall Pa.

Evergestis straminealis Hüb., black headed cabbage worm, larvae on turnip, July 22, George S. Graves, Newport N.Y.

Hypsopygia costalis Fabr., clover hay worm, larvae, Mar. 16, J. Mace Smith, Ithaca N.Y.

Archips rosaceana Harr., adult, June 6, Reinlein Gasoline Torch Co., Mt Vernon N.Y. Same, July 11, C. J. Locke, Ogdensburg N.Y. Same, larva on rose, June 25, C. J. Locke, Ogdensburg N.Y.

Gelechia aceriella Clem., larva on maple, Aug. 27, George S. Graves, Newport N.Y.

Bucculatrix pomifoliella Clem., apple leaf *Bucculatrix*, cocoons on apple, Nov. 17, L. L. Woodford, Berwyn N.Y.

Tineola biselliella Hummel, clothes moth, larva in a mattress, June 25, Mrs P. N. Nicholas, Geneva N.Y.

Neuroptera

Psocus venosus Burm., on maple, Aug. 12, George S. Graves, Newport N.Y.

Sialis infumata Newm., alder fly, June 6, C. J. Locke, Ogdensburg N.Y.

Trichoptera

Mystacides nigra Linn., July 11, C. J. Locke, Ogdensburg N.Y.

Plecoptera

Taeniopteryx fasciata Burm., Mar. 25, F. B. Calkins, Ossining N.Y.

Pteronarcys regalis Newm., adult, June 6, C. J. Locke, Ogdensburg N.Y.

Hemiptera

Canthophorus cinctus Beauv., adult, July 24, C. R. Pettis, Saranac Inn N.Y.

? *Nezara hilaris* DeG., nymphs killing asparagus beetle grubs, Sep. 3, W. F. Greene, Mt Vernon N.Y.

Leptopterna dolabrata Linn., on wheat, June 15, J. Jay Barden, Stanley N.Y. Same, adult, June 25, C. J. Locke, Ogdensburg N.Y. Same, July 11, C. J. Locke, Ogdensburg N.Y.

Calocoris rapidus Say, adult, June 25, C. J. Locke, Ogdensburg N.Y.

Poecillocapsus lineatus Fabr., July 11, **C. J. Locke**, Ogdensburg N.Y.

Capsus ater Linn., adult, June 25, **C. J. Locke**, Ogdensburg N.Y.
Same, July 11, **C. J. Locke**, Ogdensburg N.Y.

Acanthia lectularia Linn., bedbug, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Corythuca marmorata Uhler, adults on chrysanthemum, June 1, **Harry Blauvelt**, Coeyman N.Y.

Coriscus subcoleopterus Kirby, adult, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Acholla multispinosa DeG. nymphs on grape, May 25, **F. R. Calkins**, Ossining N.Y.

Cicada tibicen Linn., harvest fly, adult, Aug. 12, **George S. Graves**, Newport N.Y. Same, Aug. 24, **H. B. Taylor**, Albany N.Y.

Ceresa taurina Fitch, tree hopper scars on apple, Ap. 24, **Mr Niles**, Chatham N.Y.

Telemona reclinata? Fitch, July 11, **C. J. Locke**, Ogdensburg N.Y.

Psylla pyricola Riley, pear psylla, all stages on pear, July 26, **Jacob H. Wagar**, Cropseyville N.Y. Same, nymphs on pear, Aug. 17, **Miss M. L. Williams**, Sherburne N.Y. Same, pupa on pear, May 25, **G. F. White**, Preston Hollow N.Y.

Chermes pinicorticis Fitch, pine bark chermes, eggs on white pine, May 2, **C. R. Pettis**, Saranac Inn N.Y.

Pemphigus tessellatus Fitch, larvae and adult on alder, Aug. 29, **C. R. Pettis**, Saranac Inn N.Y.

P. popularius Fitch, adult on poplar *P. balsamifera*, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Hormaphis hamamelidis Fitch, galls on witch hazel, Aug. 12, **George S. Graves**, Newport N.Y.

Schizoneura americana Riley, adults on elm, June 15, **C. J. Locke**, Ogdensburg N.Y.

Lachnus viminalis Fonsc., adult, May 25, **F. R. Calkins**, Ossining N.Y.

Drepanosiphum acerifolii Thos., adults on *Acer saccharinum* June 26, **George S. Graves**, Newport N.Y.

Aphis gossypii Glover, adults and larvae on tomato, Aug. 6, **C. H. Peck**, Menands N.Y.

?*Nectarophora tiliae* Monell, basswood louse, eggs on basswood, Nov. 24, **L. L. Woodford**, Berwyn N.Y.

Nectarophora rudbeckiae Fitch, adults on *Rudbeckia laciniata*, June 25, **G. G. Atwood**, Albany N.Y.

Myzus ribis Linn? on *Ribes aureum*, July 8, **W. H. Harrison**, Lebanon Springs N.Y.

M. cerasi Fabr., on cherry, May 25, **F. R. Calkins**, Ossining N.Y. Same, larvae and adult on *Prunus pennsylvanica*, July 24, **C. R. Pettis**, Saranac Inn N.Y.

Rhopalosiphum solani Thos., tomato louse, all stages, on tomato, June 9, **J. M. Dolph**, Port Jervis N.Y.

Callipterus betulaeccolens Fitch, birch leaf aphid on cut leaved birch, Aug. 8, **E. P. VanNess**, East Greenbush N.Y.

Lepidosaphes ulmi Linn., appletree bark louse, eggs on lilac, Mar. 17, **T. L. M.**, Staten Island N.Y. Same, adults on willow, May 2, **M. T. Richardson**, New York.

Chrysomphalus tenebricosus Comst., gloomy scale insect, on maple, Dec. 29, **G. W. Herrick**, Vicksburg Miss.

Aspidiotus perniciosus Comst., San José scale, adults and young on apple, Nov. 3, **Edward V. Cox**, New York city. Same, adults and young on peach and plum, Dec. 29, **G. W. Herrick**, Ellisville Miss. Same, adults on Japanese quince, Feb. 23, Albany N.Y. Same, young adults on Japanese quince, May 7, **M. T. Richardson**, New York. Same, adults on apple, May 16, **A. N. Cloud**, Coxsackie N.Y. Same, adults on pear, June 9, **George M. Adams**, Spencerport N.Y.

A. forbesi Johns., cherry scale insect, adults on cherry, Dec. 29, **Glenn W. Herrick**, Meridian Miss.

A. ancylus Putn., Putnam's scale, young on apple (fruit) Nov. 10, **C. H. Darrow**, Geneva N.Y. Same, adult on white birch, Ap. 7, **Prof. C. F. Hodge**, Clark University, Worcester Mass.

Poliaspis carissae Ckll., adults on carissa, Dec. 22, **T. D. A. Cockerell**, East Las Vegas N.M.

Pheucaspis natalensis Ckll., adults on nango, Dec. 12, **T. D. A. Cockerell**, East Las Vegas N.M.

Aulacaspis rosae Bouché, rose scale insect, on blackberry, Nov. 24, **L. L. Woodford**, Berwyn N.Y.

Chionaspis euonymi Comst., euonymus scale, adults on euonymus, Sep. 19, **T. W. Baldwin**, Nyack N.Y.

C. lintneri Comst., adults on cornus, Ap. 27, **H. C. Peck**, Rochester N.Y.

Eulecanium tulipiferae Cook, tuliptree scale insect, adults and young on tulip, Aug. 2, **Mrs W. H. Whitaker**, Flushing N.Y.

E. prunastri? Fonsc., New York plum scale, adults on pear, June 12, **E. L. Mitchell**, Clarksville N.Y.

E. nigrofasciatum Perg., black banded lecanium on peach, May 1, **G. S. Clarke**, Milton N.Y.

E. armeniacum Craw., adults on crimson rambler rose, May 26, **Myron S. Wheeler**, Berlin Mass.

Coccus hesperidum Linn., on begonia, June 6, **C. J. Locke**, Ogdensburg N.Y.

Lecanium sp., adult on trumpet vine, June 10, **C. E. Eldridge**, Leon N.Y.

Pulvinaria innumerabilis Rathv., maple tree scale insect, adult on maple, June 20, **M. T. Tyers**, Dobbs Ferry N.Y.

Halimococcus lampas Ckll., adults on palm, Dec. 22, **T. D. A. Cockerell**, East Las Vegas N.M.

Orthoptera

Ceuthophilus maculatus Say, spotted wingless grasshopper, adult, May 15, **C. E. Wieting**, Cobleskill N.Y.

Thysanura

Achorutes packardi Folsm., adults on peartree bark Ap. 7, **A. W. K. Lick**, Germantown N.Y.

Arachnida

Micrathena sagittata Walck., adult killing asparagus beetles, Sep. 3, **W. F. Greene**, Mt Vernon N.Y.

Ixodes cruciarius Fitch, tick, Ap. 21, **C. H. North**, Dannemora N.Y.

Dermacentor americanus, the dog or wood tick, adult on dog, July 26, **E. N. Huyck**, Rensselaerville N.Y.

Chernes sanborni Hagen, adult on house fly, Sep. 7, **Dr H. E. Smith**, Norwich N.Y.

Trombidium muscarum Riley, adults on house fly, Sep. 7, **Dr H. E. Smith**, Norwich N.Y.

Phytoptus quadripes Shimer, galls on *Acer dasycarpum*, July 3, **G. G. Atwood**, Albany N.Y.

Bryobia pratensis Garm., clover mite, eggs on peach, Nov. 17, **L. L. Woodford**, Berwyn N.Y.

Gamasus sp. adult? May 21, **F. R. Calkins**, Ossining N.Y.

Myriapoda

Scutigera forceps Raf., house centipede, adults in house, Sep. 22, **Chancey Whitmyre**, Schenectady N.Y.

The following is a small collection, except a few species which have not been determined, of insects kindly contributed by Mr J. R. de la Torre Bueno of New York city, who collected the same in that vicinity.

Cossonus platealea Say

Centrinus picumnus Hbst.

C. scutellum-album Say

Madarus undulatus Say

Baris transversa Say

Copturus minutus Lec.

Conotrachelus seniculus Lec.

C. nenuphar Hbst.

Gymnetron teter Fabr.

Anthonomus signatus Say

Otidocephalus chevrolatii Horn

Phytonomus nigrirostris Fabr.

P. punctatus Fabr.

Apion nigrum Hbst.

Sitones flavescens Marsh

S. hispidulus Germ.

Aphrastus taeniatus Gyll.

Otiobrychus ovatus Linn.

Phyxelis rigidus Say

Attelabus nigripes Lec.

Rhynchites bicolor Fabr.

Eugnamptus collaris Fabr.

Rhipiphorus limbatus Fabr.

Mordellistena aspersa Melsh.

M. comata Lec.

M. trifasciata Say

Mordella marginata Melsh.

Bruchus musculus Say

Ceratomyia caminea Fabr.

Trichius affinis Gory.

Ligyris gibbosus DeG.

Chalepus trachypygus Burm.

Anomala lucicola Fabr.

Macrodaetylus subspinosus Fabr.

Chauiognathus pennsylvanicus DeG.

Photinus consanguineus Lec.

Lucidota atra Fabr.

Calopteron reticulatum Fabr.

Adalia bipunctata Linn.

Coccinella 9-notata Hbst.

Hippodamia glacialis Fabr.

Silpha surinamensis Fabr.

Harpalus caliginosus Fabr.

Casnonia pennsylvanica Linn.

Cicindela punctulata Fabr.

EXPLANATION OF PLATES

PLATE 1

Dorsal view of *Eniscopilus arcuatus* Felt

PLATE 2

Ophionid wings

- 1 *Ophion ferruginipennis* Felt
- 2 *Ophion bifoveolatum* Brullé
- 3 *Ophion bilineatum* Say
- 4 *Eniscopilus appendiculatus* Felt
- 5 *Ophion abnormum* Felt
- 6 *Eremotylus macrurus* Linn.

PLATE 3

Work of *Chrysanthemum* lace-bug, *Corythuca marmorata* Uhler

PLATE 4

Chrysanthemum lace-bug

Corythuca marmorata Uhler

- 1 Section of leaf showing insertion of eggs below the surface
- 2 Dorsal spines of stage 1: *a*, arising from cone-shaped base, *b*, directly from the body
- 3 Lateral abdominal spine of stage 1
- 4 Dorsal view of nymph in stage 2
- 5 Dorsal spines of stage 2: *a*, arising from cone-shaped base, *b*, directly from the body
- 6 Lateral abdominal spine of stage 2
- 7 Dorsal spines of stage 3: *a*, arising from cone-shaped base, *b*, directly from the body
- 8 Lateral abdominal spines of stage 3
- 9 Dorsal view of nymph in stage 4
- 10 Lateral abdominal spines of stage 4
- 11 Dorsal spines of stage 4: *a*, arising from cone-shaped base, *b*, directly from the body
- 12 Lateral abdominal spines of stage 5
- 13 Antennae in stage 5

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Plate 1



Eniscopilus arcuatus

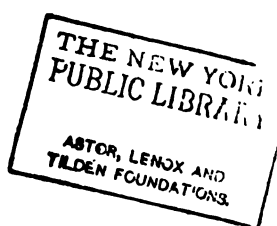


Plate 2



1



2



4



3



5



6

Ophionid wings

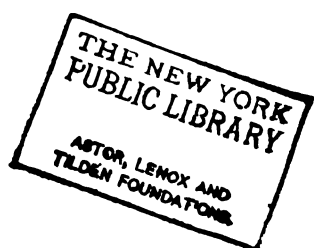
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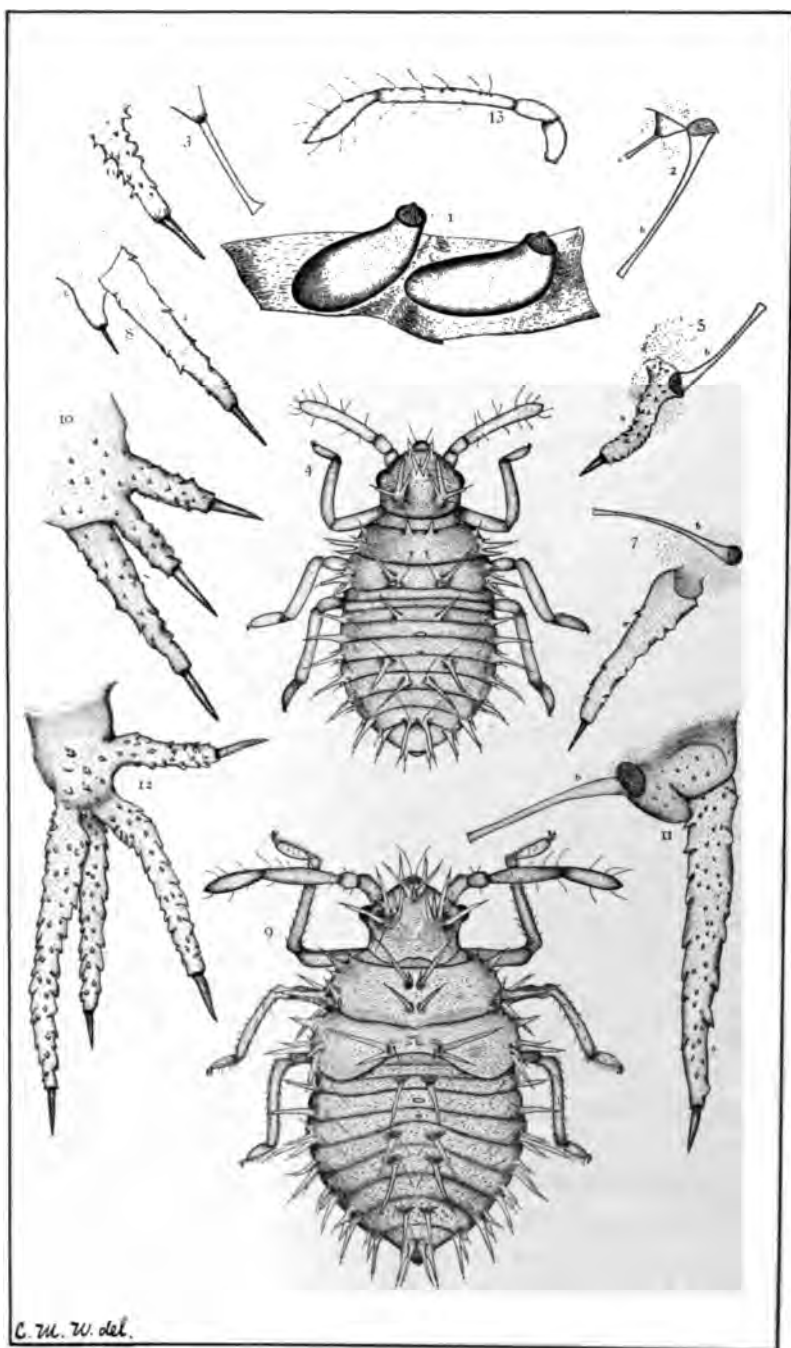
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Plate 3



Work of chrysanthemum lace bug





C. M. W. del.

Chrysanthemum lace bug

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MUSEUM PUBLICATIONS

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4 Peck, C. H. N. Y. Edible Fungi, 1895-99. 106p. 25pl. Nov. 1900. 75c.
This includes revised descriptions and illustrations of fungi reported in the 49th, 51st and 52d reports of the state botanist.

5 Clarke, J: M. & Ruedemann, Rudolf. Guelph Formation and Fauna of New York State 190p. 21pl. July 1903. \$1.50, cloth.

6 ——— Naples Fauna in Western New York. 268p. 26pl. map. \$2, cloth.

7 Ruedemann, Rudolf. Graptolites of New York. Pt 1 Graptolites of the Lower Beds. *In press.*

Felt, E. P. Insects Affecting Park and Woodland Trees. *In preparation.*

Natural history of New York. 30v. il. pl. maps. Q. Albany 1842-94.

DIVISION 1 ZOOLOGY. De Kay, James E. Zoology of New York; or, The New York Fauna; comprising detailed descriptions of all the animals hitherto observed within the State of New York with brief notices of those occasionally found near its borders, and accompanied by appropriate illustrations. 5v. il. pl. maps. sq. Q. Albany 1842-44. *Out of print.*
Historical introduction to the series by Gov. W: H. Seward. 178p.

v. 1 pt1 Mammalia. 13+146p. 33pl. 1842.
300 copies with hand-colored plates.

v. 2 pt2 Birds. 12+380p. 141pl. 1844.
Colored plates.

v. 3 pt3 Reptiles and Amphibia. 7+98p. pt4 Fishes. 15+415p. 1842.
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v. 4 Plates to accompany v. 3. Reptiles and Amphibia 23pl. Fishes 79pl. 1842.
300 copies with hand-colored plates

v. 5 pt5 Mollusca. 4+271p. 40pl. pt6 Crustacea. 70p. 13pl. 1843-44.
Hand-colored plates: pt5-6 bound together.

DIVISION 2 BOTANY. Torrey, John. Flora of the State of New York; comprising full descriptions of all the indigenous and naturalized plants hitherto discovered in the State, with remarks on their economical and medical properties. 2v. il. pl. sq. Q. Albany 1843. *Out of print.*

v. 1 Flora of the State of New York. 12+484p. 72pl. 1843.
300 copies with hand-colored plates.

v. 2 Flora of the State of New York. 572p. 89pl. 1843.
300 copies with hand-colored plates.

DIVISION 3 MINERALOGY. Beck, Lewis C. Mineralogy of New York; comprising detailed descriptions of the minerals hitherto found in the State of New York, and notices of their uses in the arts and agriculture. il. pl. sq. Q. Albany 1842. *Out of print.*

v. 1 pt1 Economical Mineralogy. pt2 Descriptive Mineralogy. 24+536p. 1842.
8 plates additional to those printed as part of the text.

DIVISION 4 GEOLOGY. Mather, W: W.; Emmons, Ebenezer; Vanuxem, Lardner & Hall, James. Geology of New York. 4v. il. pl. sq. Q. Albany 1842-43. *Out of print.*

v. 1 pt1 Mather, W: W. First Geological District. 37+653p. 46pl. 1843.

v. 2 pt2 Emmons, Ebenezer. Second Geological District. 10+437p. 17pl. 1842.

v. 3 pt3 Vanuxem, Lardner. Third Geological District. 306p. 1842.

v. 4 pt4 Hall, James. Fourth Geological District. 22+683p. 19pl. map. 1843.

DIVISION 5 AGRICULTURE. Emmons, Ebenezer. Agriculture of New York; comprising an account of the classification, composition and distribution of the soils and rocks and the natural waters of the different geological formations, together with a condensed view of the meteorology and agricultural productions of the State. 5v. il. pl. sq. Q. Albany 1846-54. *Out of print.*

v. 1 Soils of the State, their Composition and Distribution. 11+371p. 21pl. 1846.

v. 2 Analysis of Soils, Plants, Cereals, etc. 8+343+46p. 42pl. 1849.
With hand-colored plates.

College Department

COLLEGES, COLLEGIATE, PROFESSIONAL AND TECHNICAL SCHOOLS

Bulletin 22

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University of the State of New York

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WITH POWER OF APPOINTMENT

1892	WILLIAM CROSWELL	DOCTOR D.D. LL.D.	Chancellor	Albany
1898	WHITELAW REID	M.A. LL.D.	Vice Chancellor	New York
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1899	J. GUILFORD SMITH	M.A. LL.D.	- -	Holbrook
1893	LEWIS A. STIMSON	B.A. LL.D. M.D.	- -	New York
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1896	CHARLES R. BRINER	M.A. LL.D.		

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1901	BENJAMIN D. ORRILL JR.	LL.D.	Governor, ex officio	
1904	ROBERT C. FRYER	M.A.	- - -	Albany
1902	WILLIAM NOTTINGHAM	M.A. Ph.D. LL.D.	-	Syracuse
1903	FRANK W. HERRICK	Lieutenant Governor, ex officio		
1903	JOHN F. O'BRIEN	Secretary of State, ex officio		
1903	CHARLES A. GARDINER	LL.B. M.A. Ph.D. LL.D.	-	New York
1903	CHARLES S. FRANCIS	B.S.	- - -	Troy

One vacancy.

SECRETARY

chosen by senate

1900	JAMES RUSSELL PARSONS JR.	M.A. LL.D.
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MEMBERS OF DEPARTMENTS

1888	MELVIL DEWEY	M.A. LL.D.	State Library and House Education
1890	JAMES RUSSELL PARSONS JR.	M.A. LL.D.	Administration, College and High School Dep'ts
1890	FREDERICK J. H. MERRILL	Ph.D.	State Museum

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College Department

INCLUDING UNIVERSITIES, PROFESSIONAL AND TECHNICAL SCHOOLS

Bulletin 22

DIRECTOR'S REPORT 1903

To the Regents of the University of the State of New York

I submit herewith the following report of the College Department for the year ending June 30, 1903,¹ prepared under my direction by Director's Assistant Henry L. Taylor.

Scope. This department, supported almost entirely by fees, includes universities, professional, technical and other special schools, and all matters pertaining to degrees or licenses.

The work of this department is closely allied with that of the Administrative and High School Departments and falls naturally into four divisions: administration, inspection, examination and registration. To avoid repetition, a concise statement of the administration of this department appears in the *Secretary's Report 1903*; of the inspection and examinations, in the *Director's Report of the High School Department 1903*.

Registration. Educational institutions are registered in full or in part by the University of the State of New York as they maintain proper educational standards, have resources, facilities and equipment for imparting either collegiate or high school training, and afford instruction under competent teachers in approved courses. A diploma certifying a degree carries with it the right to assume a title and is evidence of scholastic ability, a license the right to enter on the practice of a profession. Registered degrees are of two classes as they meet the ordinances of the Uni-

¹All statistics in this report are for the year ending June 30, 1903, but information is added touching the work of the department to Mar. 31, 1904, when the report passed through the press.

versity or the rules of the Court of Appeals. They give exemption from entrance requirements to professional study, licensing examinations, and membership in learned bodies.

University credentials. These are of collegiate or high school grade as they evidence successful work completed in a registered college or high school. The college credentials include the course certificate and the combined baccalaureate and medical certificate, the former certifying to the registration of a baccalaureate degree, the latter to a combined baccalaureate and medical degree; diplomas certifying to the degrees of certain institutions of college rank incorporated under special charters; licenses to practise in the State of New York granted on examinations conducted by the University and the state boards of examiners.

The high school credentials are of two series (1) the academic, issued on Regents examinations only and (2) the equivalent, issued for work completed in registered institutions supplemented, if necessary, by Regents examinations.

Incorporation. The following action was taken by the Regents:

Limited charters granted. Dec. 4, 1902, New York School of Journalism, Brooklyn; May 21, 1903, Bible Teachers Training School, New York; Brooklyn Eastern District Dispensary and Hospital Training School for Nurses; First Austrian Talmud Torah Association, New York; Highland Pines Sanitarium Training School for Nurses, Corning; Jamaica Training School for Nurses; Rabbi Jacob Joseph School, New York; Samaritan Hospital Training School for Nurses, Troy; Society of Ohel Torah, New York.

Association charters granted. Dec. 4, 1902, American Institute of Social Service, New York; Ontario County Historical Society, Canandaigua; May 21, 1903, Anthological Society, New York; Franklin County Historical Society, Malone; New York City Teachers Association, department of university extension.

Degrees conferred. Within the year the Regents have conferred the following degrees: [for lists of names see Appendix, 1]

Bachelor of divinity on 18 graduates of Union Theological Seminary

Bachelor of arts on 13 graduates of Adelphi College; on 2 graduates of Keuka College

Bachelor of science on 1 graduate of Adelphi College

Bachelor of science in civil engineering on 3 graduates of Clarkson School of Technology; on 5 graduates of Mackenzie College, Sao Paulo, Brazil. (There were also 2 granted in 1900 not previously published.)

Bachelor of science in electrical engineering on 2 graduates of Clarkson School of Technology

Bachelor of science in mechanical engineering on 1 graduate of Clarkson School of Technology

Bachelor of library science on 3 graduates of New York State Library School

Doctor of medicine on 8 graduates of the New York Medical College and Hospital for Women

Doctor of dental surgery on 48 graduates of the New York College of Dentistry¹ and 10 graduates of the New York Dental School

Licenses. During the year the Regents have licensed as a result of state examinations: [for lists of names, *see* Appendix, 2] 633 physicians (562 old school, 41 homeopaths, 30 eclectics); 176 dentists; 17 veterinary surgeons; and 11 certified public accountants.

Under exemptions in the professional laws the Regents have also licensed during the year: [for lists of names, *see* Appendix, 3] 69 physicians; 36 dentists; 6 veterinary surgeons; and 3 certified public accountants.

Extension courses. Under the charter of Greater New York, applicants for admission to the licensing examinations of the department of education as teachers in certain positions in the schools of that city are required to afford evidence of degrees registered by the University of the State of New York. The extension courses of the University afford an opportunity for supplementing the work of those not holding such registered degrees.

¹These degrees are granted by the trustees and directors on the recommendation of the faculty with the consent of the Regents of the University.

In conference with the superintendent of public instruction of Greater New York, progress has been made toward the adoption of formal rules for the registration of extension courses to meet the requirements of the charter. Under the tentative rules for registration the extension center (1) must possess satisfactory facilities in buildings and equipment; (2) must employ registered instructors; (3) must offer approved courses meeting the minimum requirement of the department of education of Greater New York; (4) must require resident study evidenced by actual attendance on classroom recitations; (5) must be inspected annually; (6) must complete courses with formal examinations.

Registration. The study of credentials from the United States and foreign countries continues to afford valuable information concerning the school systems and educational laws of the world.

Among the credentials submitted for recognition during the year were credentials from 29³ foreign countries and from 43 political divisions of the Union, in 18 languages, viz, Arabic, Armenian, Bohemian, English, French, German, Greek, Hungarian, Italian, Japanese, Latin, Marathi, Polish, Roumanian, Russian, Spanish, Swedish and Turkish.

The credentials submitted and desired afford a clearer idea of the extent of this work, which not only involves accuracy in details of administration to avoid indirection and inconsistency, but also requires wide knowledge of educational systems and legal requirements to equate wisely and justly.

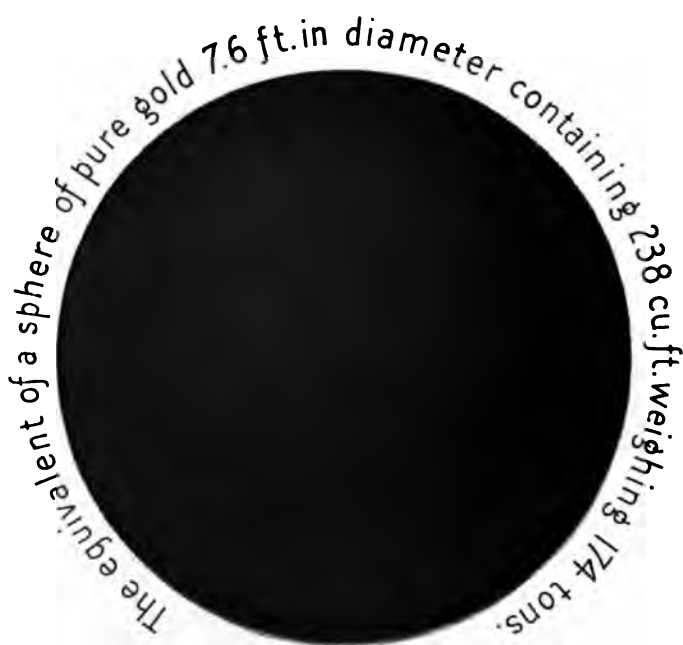
Examinations. The dates, credentials and subjects of the examinations for the year [for details see Appendix, 4] show the extent of examinations conducted by the College Department. The expenses of examinations in medicine, dentistry, veterinary medicine, public accounting and nursing are borne by the candidates and involve no outlay whatever of state money. The subjects included academic, medical, dental, veterinary, elementary classification, elementary bibliography, nature study, business, certified public accounting, dictionary cataloguing, library extension and genetic psychology.



New York State

Net property invested in higher institutions

Colleges, professional and technical schools



\$ 86,375,792

1903

Summary from annual reports of colleges, professional, technical and special schools. In 1903 there were 118 institutions [for details *see* Appendix, 5] with a teaching force of 3308 men and 563 women, total 3871, affording instruction to 25,029 men and 14,689 women, total 39,718. A trifle over 10% of these students graduated, as shown by the number of first degrees conferred on examination, 4041. The net property of these institutions aggregated \$86,375,792 and the year's expenditures \$10,061,269.

Comparisons. During the year the number of institutions was increased by four, the faculty by 325, the students by 5354, the graduates by 388, the net property by \$3,444,217, the expenditures by \$1,352,571.

During the decade 1893-1903 the number of these institutions [for details *see* Appendix, 6] was increased by 27 (29%), the faculties by 1659 (75%), the students by 17,885 (82%), the graduates by 1613 (66%), the net property by \$31,387,040 (57%), the expenditures by \$5,268,282 (109%). The number of women on the faculty increased from 13.4% to 14.6%; and the number of women students from 31.9% to 37%.

Comparison of higher and secondary education. In 1903 there were 780 high schools and academies [for details *see* High School Department Director's Report 1903, p. r34, r35] with a teaching force of 1666 men, 3128 women, total 4794, affording instruction to 39,924 boys and 55,172 girls, total 95,096. About 27% [*see* High School Department Report 1903, p. r9] of the pupils enrolled in the highest elementary grade in 1899 (46,741) graduated in 1903, or 12,620 estimate. The net property of secondary schools aggregated \$33,771,006 and the year's expenditures \$7,107,000.

As the eight years of secondary and higher instruction presuppose eight years of elementary, the sum of these items of secondary and higher institutions will afford an interesting contrast with elementary, 900 institutions; 8665 teachers; 134,814 students; 16,661 graduates; \$120,146,798 net property; \$17,168,269 expenditures.

Relative receipts and expenditures, with comparative value of property

Receipts. In the higher institutions [for details see Appendix, 7] the receipts were \$9,700,239 in 1902 as compared with \$11,076,594 in 1903, increase \$1,376,355; in the secondary institutions [for details see High School Department Director's Report 1903, p. r34, r35] the receipts were \$7,306,124 for 1903.

Expenditures. In the higher institutions expenditures were \$8,708,698 in 1902 and \$10,061,269 in 1903, increase \$1,352,571; in the secondary institutions the expenditures were \$7,107,000 for 1903.

Buildings and grounds. The value in higher institutions was \$37,482,819 in 1902 and \$37,847,127 in 1903, increase \$364,308; in the secondary institutions the value was \$24,864,727 for 1903.

Library and apparatus. The value in higher institutions was \$4,410,422 in 1902 and \$4,516,457 in 1903, increase \$106,035; in the secondary institutions the value was \$1,859,203 for 1903.

Other property. The value in higher institutions in 1902 was \$48,591,062, in 1903, \$51,894,175, increase \$3,303,113; in secondary for 1903, \$9,016,683.

Total property. In higher institutions for 1902 this was \$90,484,303, in 1903, \$94,257,759, increase \$3,773,456; in secondary for 1903, \$35,740,613. The increase in total property for the year 1903 in the higher institutions is \$3,773,456; in the secondary, \$3,196,452.

COLLEGES AND UNIVERSITIES

Action by the Regents. Dec. 3, 1903, in accordance with bylaw 34, the Regents voted unanimously by ballot in favor of the following resolution, the candidates for the honorary degree in question having been recommended therefor by the executive committee and the recommendation approved by the Regents at a meeting held June 29, 1903.

Whereas, The faculty and trustees of Adelphi College have asked permission of the University to confer the honorary degree

of master of arts on William Ordway Partridge and Charlotte Morrill.

Resolved, That the Chancellor and the secretary be authorized to add their signatures to diplomas conferring the said honorary degree of master of arts in these two cases.

Action by the director. Under requirements of the revised charter of Greater New York, three degrees in pedagogy were registered in 1903. The School of Pedagogy of New York University, desiring to raise the standing of the bachelor, master and doctor degrees in pedagogy to the rank generally accorded corresponding degrees in arts and science, established courses for these degrees that could be registered under University ordinances. As a result of several conferences, prolonged correspondence and careful consideration of the question in all its bearings, it was determined that (1) the first degree should require at least a three year high school training or equivalent for entrance and four years of resident study for graduation, the last or senior year to be resident study in the institution granting the degree; (2) the second and third degree should require the first and second respectively and be granted on resident work only; (3) the unit of measure for a collegiate year should be at least 15 week hours for 40 weeks or the equivalent; (4) the approved courses should be of collegiate grade, and 25% should be the maximum allowance made professional courses for admission to advanced standing; (5) the professional schools of pedagogy should be registered and their standing given on application.

College training. The value of college training as a preparation for the service of society becomes increasingly evident as reliable data regarding successful men are accumulated and examined. Those who have denied the value of this training have compared college men who failed to attain prominence in any pursuit with men who never attended a college but have become eminent, or they have not considered how small is the proportion of college graduates in a given calling to the aggregate of persons engaged in it. Much exact information concerning the educational advantages of Americans of prominence and influence has been collected; and the study of this material shows that collegiate educa-

tion affords a valuable practical discipline, and that college rank is to a considerable extent an index to future distinction. The secretary's report for 1901 contained some calculations, based partly on the compilations in the biographic dictionary, *Who's Who in America*, illustrating the fact that the proportion of men of collegiate education who reach distinction greatly exceeds the proportion of their competitors in the same fields. And in a recent number of the *Atlantic Monthly* is an article, "College Rank and Distinction in Life," from which the following statements are taken :

During the 19 years from 1869 to 1887 inclusive, graduation honors in special subjects at Harvard University were won by 375 men, " of whom 71, or one in $5\frac{1}{6}$, are in *Who's Who*." Of the 81 students who attained highest honors, " no less than 29, or more than one in three, are in *Who's Who*." The proportion of men in *Who's Who* from the different categories of graduates in the classes from 1869 to 1887 inclusive is as follows :

Total graduates.....	224	out of 3239	or one in	14.46
First seventh of class.....	67	" 473	"	7.05
First scholar.....	7	" 19	"	2.71
First four scholars.....	16	" 76	"	4.75
Bowdoin prize men.....	18	" 89	"	4.94
Honors in special subjects.....	71	" 375	"	5.28
Highest special honors.....	29	" 81	"	2.79

The records of success in life achieved by Yale graduates who gained the valedictory or salutatory honors of their classes are equally entitled to notice. The *New York Evening Post* has published some recent conclusions derived from these records. Of the 190 men who received one of these honors in a period of 95 years, 17 who died within 10 years after graduating and 20 whose graduation is too recent to permit opportunity for distinction are excluded from consideration; and it is stated that 85 of the remainder, or about 56%, have commanded attention by success in some field of effort. It is also said that " the 85 include 41 full professors, 13 college presidents, among them two presidents of Yale, one of Columbia, and one of the University of California,

five judges of high courts, including one, W. H. Taft, who has become secretary of war, and 26 in other branches of life work. . . . Five successive valedictorians, beginning with 1846, won high public eminence."

Registration. The question of the registration of the combined baccalaureate and medical degrees is discussed under Professional schools. A careful revision has been made of the list of colleges and universities registered as meeting the ordinances of the Regents, class 1; or the rules of the Court of Appeals, class 2; or in part (class 3).

The Court of Appeals and the Regents of the University of the State of New York both refuse to recognize as a college or university an institution which, though taking the name, in reality does work of a lower grade. Colleges of medicine, pharmacy, dentistry, business colleges and all similar professional and technical schools are not registered as colleges. By college is understood an institution which requires for admission four years of academic or high school preparation in addition to the preacademic or grammar school studies, and that gives four full years of college instruction as a condition of graduation. Institutions with courses equivalent to three years of college work are sometimes registered when they require three full years of academic preparation, as are other institutions that admit after two years of preparation but that require a minimum of four years of college work. In all cases the total of high school and college work must not be less than six years in advance of grammar school studies or the institution can not be registered as giving a full college course.

The court also refuses to recognize as "study in a college" work in an academic or lower department conducted and supervised by a college. To be accepted as an equivalent by the Regents, the work must be of college grade.

Comparison of University institutions, grouped in four classes

For details *see* Appendix, 8

Liberal arts and science. This group includes the colleges for men, the colleges for women, the coeducational colleges and the

graduate departments. In 1903 the 38 institutions of this group reported 1226 men and 232 women teachers—total 1458; 5300 men, 5289 women students—total 10,589; 2020 graduates (as shown by the first degrees); \$54,372,121 net property; \$7,524,964 receipts and \$6,720,684 expenditures.

Professional. This group includes the schools of theology, law, education, medicine, dentistry, pharmacy, veterinary medicine, ophthalmology, library and commerce. In 1903 the 53 institutions of this group reported 1795 men and 152 women teachers—total 1947; 9744 men, 2246 women students—total 11,990; 1573 graduates (as shown by the first degrees); \$22,015,041 net property; \$2,754,422 receipts and \$2,625,839 expenditures.

Technical. This group includes the schools of engineering, technology, architecture, art, music, ceramics, agriculture and Pratt Institute. In 1903 the 20 institutions of this group reported 449 men and 137 women teachers—total 586; 4456 men, 4142 women students—total 8598; 397 graduates (as shown by the first degrees); \$5,345,581 net property; \$495,161 receipts and \$464,060 expenditures.

Special. This group includes American Institute of Phrenology, Catholic Summer School, Chautauqua Institution, Conrad Poppenhusen Association, Cooper Union Night School, Hebrew Technical Institute, New York Trade School. In 1903 the 7 institutions of this group reported 197 men and 42 women teachers—total 239; 5846 men, 3229 women students—total 9075; 51 graduates (as shown by the first degrees); \$4,643,049 net property; \$302,047 receipts and \$250,686 expenditures.

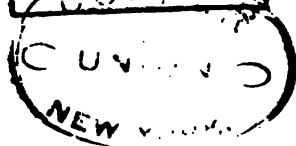
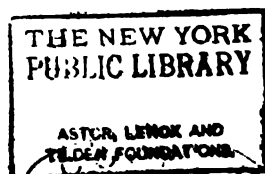
Rank in teachers, students, property and expenditures 1903

For further details of tables 1-3 see Appendix, 9

Table 1 shows that Columbia University was first in the number of officers of instruction, the number of students, the net property and the annual expenditures, excluding grounds and buildings; Cornell second; New York third, in students fourth; Syracuse fourth, in students third; Buffalo fifth in officers and students, sixth in property and expenditures; Union sixth in

Number of higher students enrolled in New York State each year 1893 - 1903

Year	Men	Women	Total
1903	25,029	14,689	39,718
1902	22,970	11,394	34,364
1901	21,268	10,935	32,203
1900	19,798	9,597	29,395
1899	19,799	11,691	31,490
1898	19,814	9,987	29,801
1897	18,899	9,108	28,007
1896	17,623	8,697	26,320
1895	17,803	8,928	26,731
1894	16,398	7,578	23,976
1893	15,107	6,726	21,833
Decades increase	9,922	7,963	17,885
Average annual increase	992	796	



officers of instruction and numbers of students, fifth in property and expenditures.

The four highest institutions in table 2, excluding those given in table 1, are The College of the City of New York, which is first in officers of instruction, third in students, fourth in net property and third in annual expenditures; the Normal College of the City of New York, second in officers of instruction, first in the number of students, 12th in net property and seventh in annual expenditures; Vassar, third in officers of instruction, second in the number of students, first in net property, and second in annual expenditures; Barnard, fourth in officers of instruction, fourth in number of students, second in net property and first in annual expenditures.

The four highest institutions in table 3 excluding those given in table 1 are, New York Postgraduate Medical School, which is first in officers of instruction, eighth in students, 19th in net property and 18th in expenditures; New York Polyclinical Medical School and Hospital, second in officers of instruction, 11th in students, 41st in net property, 22d in expenditures; Teachers College, third in officers of instruction, fourth in students, fifth in net property, and first in expenditures; Pratt Institute, fourth in officers of instruction, second in students, second in net property, and third in expenditures.

Gifts and bequests for education 1893-1902. A study of the gifts and bequests for educational purposes (including hospitals) of \$5000 each and upward from Appleton's annual cyclopædias [for details *see* Appendix, 10] shows that residents of New York State gave during the decade \$2,689,166 to elementary education; \$5,395,000 to secondary; \$53,895,313 to college; \$61,979,479 total; \$87,000 to law; \$4,967,000 to medicine; \$17,630,507 to hospitals; \$4,873,000 to theology; \$27,557,507 total to professional education; \$11,918,000 to technical; \$12,157,940 to special; \$23,069,708 to libraries; \$47,145,648 total to technical.

The gifts and bequests of the United States including New York, for the same period, were \$11,477,216 to elementary; \$16,657,063 to secondary; \$173,688,916 to college; \$201,823,195 total; \$350,-

000 to law; \$8,474,666 to medicine; \$53,985,913 to hospitals; \$10,151,166 to theology; \$72,048,745 total to professional; \$22,981,660 to technical; \$45,262,397 to special; \$39,125,155 to libraries; \$107,369,152 total to technical.

In brief, residents of New York State gave 30% of the general, 38% of the professional, 44% of the technical, and 36% of the total gifts and bequests to education during the decade 1893-1902.

Net property invested in higher institutions of New York State. In contrast with the gifts and bequests made by New York State for education during the decade, an interesting comparison may be instituted regarding the net property of higher institutions. There was invested in colleges and universities in 1893 \$40,675,346; in professional schools \$8,418,261; in technical and special \$4,258,914. In 1903 the net property invested in colleges had increased to \$54,328,120; in professional to \$21,235,951; and in technical to \$6,169,666. The average annual increase in the net property invested in higher institutions for the decade was for colleges \$1,365,275; for professional \$1,281,766; and for technical and others \$190,962.

PROFESSIONAL SCHOOLS

Combined baccalaureate and medical course. The principle announced at the University Convocation July 1, 1902, has governed all applications for admission to the medical licensing examination, i. e. that an allowance of one year in term of study should be made only to those students that plainly meet in their combined course the full equivalent of the first medical year. During the year a continuation of the study of this important and somewhat complicated subject has been in progress. The various associations of medical schools of the United States will doubtless take further action thereon in the near future.

Examinations and certificates. A summary of the examinations and certificates from 1893 to 1903 is given in Appendix, 11.

In 1893 there were seven examinations, in which 8067 answer papers were written, of which 4965, or 61.5%, were accepted. In

the four examinations of 1903 there were 41,567 papers written, of which 22,658, or 54.5% were accepted.

In 1893 there were 589 law student certificates issued, 62 on examination and 527 on equivalents; in 1903 there were 839 issued, 461 on examination, 272 on equivalents, and 106 on partial equivalents; the partial equivalents began in 1900 with 30.

In 1893 there were 28 academic equivalent certificates issued, two on examination and 26 on equivalents; in 1903 there were 328 issued, 54 on examination, 209 on equivalents, and 65 on partial equivalents; partial equivalents began in 1899 with 14.

In 1893 there were 785 medical student certificates issued, 137 on examination, 648 on equivalents; in 1903 there were 972 issued, 346 on examination, 505 on equivalents, 121 on partial equivalents; partial equivalents began in 1899 with 36.

In 1895 there were 17 dental student certificates issued, 10 on examination and seven on equivalents; in 1903 there were 290 issued, 134 on examination, 82 on equivalents, 74 on partial equivalents; the partial equivalents began in 1899 with six.

In 1897 there were six veterinary student certificates issued, four on examination and two on equivalents; in 1903 there were 46 issued, 31 on examination, 12 on equivalents, three on partial equivalents; partial equivalents began in 1899 with one.

In 1893 the total number of certificates issued was 1402, on examination 201, on equivalents 1201; in 1903 the total number was 2475, on examination 1026, on equivalents 1080, on partial equivalents 369.

The percentage of certificates issued on examination in 1903 was 41.4, on equivalents 43.6, on partial equivalents 14.9 [for fuller information *see* Appendix, 12].

Theology

Action by the Regents. May 21, 1903, it was voted that on the receipt of the written approval of the three trustees who have not signed the application, the trustees of Auburn Theological Seminary be granted the power to confer the degree of bachelor of divinity on such of its graduates as shall have satisfactorily com-

pleted its regular course of study and shall be recommended by the faculty as being duly qualified in all other respects and shall have passed all examinations and met all other requirements prescribed by law or by the University ordinances.

Law

Action by the Regents. May 21, 1903, the Regents approved the action of the trustees of St Lawrence University under their authority and under the special power granted by laws of 1869, chapter 288, and consented to their establishment of a law department by the agreement filed with the Regents for the annexation to St Lawrence University of the Brooklyn Law School now organized and under visitation of the Regents.

Law students. In 1903 there were 133 students in Albany Law School, 461 in Columbia, 224 in Cornell, 832 in New York Law School, 673 in New York University, 112 in St Lawrence, 123 in Syracuse, and 60 in Buffalo; total 2618 not including summer students.

Law school summaries [for further details *see* Appendix, 13]. In 1893 the seven institutions employed 71 officers of instruction for 1470 students (classed as graduates 54, in LL.B. course 1261, unclassified 155); in 1903 the eight institutions employed 134 officers of instruction for 2618 students (classed as graduates 55, in LL.B. course 2071, unclassified 492).

In 1893, 427 students held 439 degrees, and the LL.B. or LL.M. degrees were conferred on 434; in 1903, 787 students held 813 degrees, and the LL.B. or LL.M. degrees were conferred on 535.

In 1893 the libraries of the seven institutions contained 43,206 volumes, the total property amounted to \$63,383, receipts \$87,785, expenditures \$82,382; in 1903 the libraries of the eight institutions contained 100,276 volumes, total property amounted to \$1,140,598, receipts \$254,432, expenditures \$251,441.

In comparison with 1893, the law schools of the State show for 1903 one more institution, 63 more officers of instruction, 1148 more students (classed as graduates 1, LL.B. course 810, unclassified 337). There were 360 more in attendance with degrees

and 121 more LL.B. and LL.M. degrees conferred. The number of volumes in the libraries shows an increase of 57,070, total property increased \$1,077,215, receipts increased \$166,647, and expenditures \$169,069.

Medicine

Medical examiners. In accordance with the law, nominations were submitted to the Regents from the state societies and examiners were appointed May 21, 1903, for the ensuing year.

Appointments. Representing the Medical Society of the State of New York, William Warren Potter M.D., Buffalo, William S. Ely M.D., Rochester, Maurice J. Lewi M.D., New York; representing the Homeopathic Medical Society of the State of New York, John M. Lee M.D., Rochester, J. Willis Candee M.D., Syracuse, George E. Gorham M.D., Albany, William M. L. Fiske M.D., Brooklyn, to fill the vacancy caused by the resignation of William Morris Butler M.D. Brooklyn; representing the Eclectic Medical Society of the State of New York, Lee H. Smith M.D. Buffalo, O. W. Sutton M.D. Bath, M. H. Nichols M.D. Worcester.

Registration of medical schools. The medical schools of the United States registered or accredited by the University of the State of New York fall into two groups.

Group 1. Those registered or accredited for admission to the licensing examination after application authenticated by seal or affidavit and the signature of the executive officer [for list in force July 1, 1904, see Appendix, 14].

Group 2. Those registered or accredited for admission to registered medical schools.

The registration of the medical schools has reference to the professional educational requirement and not to the general preliminary educational requirement which must be met by candidates for admission to New York medical schools, and receives independent action.

Schools are registered in full or accredited in three classes.

Registered. The schools registered in full include those requiring the full four year medical course and making no allowance whatever for admission to advanced standing to

graduates of schools of dentistry, pharmacy, veterinary medicine or osteopathy.

Accredited. The accredited schools are of three classes:

1 Those medical schools having a three year course and making no allowance whatever for admission to advanced standing, or those schools having a four year course and making an allowance for admission to the second class on advanced standing. These graduates are admitted to the licensing examination on the completion of one year in a registered medical school if all other requirements are satisfactorily met.

2 Those medical schools having a two year course and making no allowance whatever for admission to advanced standing, or a three year course and making an allowance for admission to the second class on advanced standing, or those medical schools meeting the requirements of a four year course and making an allowance to graduates of other schools for admission to the third class on advanced standing. These graduates are admitted to the licensing examination on the completion of two years in a registered medical school if all other requirements are satisfactorily met.

3 Those medical schools having a one year course and making no allowance whatever for admission to advanced standing, or a two year course and making an allowance for admission to the second class on advanced standing, or a three year course and making an allowance for admission to the third class on advanced standing, or a four year course and making an allowance for admission to the fourth class on advanced standing. These graduates are admitted to the licensing examinations on the completion of three years in a registered medical school if all other requirements are satisfactorily met.

As medical schools are steadily advancing their requirements to meet the New York statute, registration is constantly changing.

Medical receipts and disbursements. Aug. 1, 1903, the secretary sent to the 21 state medical examiners the following statement of

receipts and expenditures connected with the administration of the medical laws from July 1, 1902, to July 30, 1903:

To the state medical examiners:

I transmit herewith a summary of the records and vouchers (all of which are open to your inspection) of the receipts and expenditures connected with the medical examinations provided for by laws of 1890, chapter 507, and laws of 1893, chapter 661, §140-53, but not including the medical student examinations, the expenses of which are borne by the University.

From July 1, 1902, to June 30, 1903, there were four examinations for license to practise medicine, at which 1144 candidates appeared before the three boards, as follows:

State Medical Society.....	1 011	
Homeopathic Medical Society.....	77	
Eclectic Medical Society.....	56	1 144a

In accordance with law, the Regents have paid or set aside for payment the expenses properly chargeable to these examinations, and have on hand at the end of the academic year \$10,800, less special expenses of each board as given below, which is to be apportioned among the three boards pro rata according to the number of candidates examined by each. This gives to the

State board	\$9 544 41	
Homeopathic board	726 92	
Eclectic board	528 67	\$10 800 ..

JAMES RUSSELL PARSONS JR

Secretary of the University

Receipts

17 \$10 fees, July 1, 1902, to June 30, 1903..	\$170	
849 \$25 " " " ..	21 225	
2 \$15 " " " ..	30	
		\$21 425

Fees returned

1 \$10 fee, July 1, 1902, to June 30, 1903..	\$10	
28 \$25 fees, " " " ..	700	
		710
		\$20 715

aOf these 196 different candidates were entitled to examination without additional fee, and many others had two or more trials.

Payments

Expenses of examiners.....	\$157 10
Parchment for licenses and printing.....	670 75
Salary of M. J. Lewi M.D. for services rendered to College Department as recommended by conference of state boards of medical examiners Jan. 15, 1892, and Oct. 16, 1901, and voted by Regents Dec. 14, 1892, from Aug. 1, 1902, to July 31, 1903	725 ..
Local expenses of conducting examinations at various points throughout the State..	1 294 43
Salary of medical clerk, Katharine L. McDonough, Aug. 1, 1902, to July 31, 1903..	1 070 ..
Tin tubes	57 50
Box	50
Examination envelopes	10 ..
Books	22 91
Services of examiners and clerks in Albany in addition to medical clerk.....	3 935 ..
Amount set aside for postage and express..	366 81
Amount set aside for fixed salaries.....	1 605 ..
	\$9 915 ..

Balance to be apportioned.....^a\$10 800 ..

Special note to state board of examiners

Pro rata distribution $\frac{10}{11}$ of \$10,800 is.....	\$9 544 41
Expenses of secretary, July 1, 1902, to June 30, 1903, as follows:	
Salary of secretary, M. J. Lewi.....	\$600 ..
Stenographer	3 55
Telegrams	6 ..
Clerk hire	182 ..
Telephone	7 79
Postage	32 76
Affidavits	7 28
Messenger	20
Transcript of records.....	2 60
Rubber bands and stamp stand.....	30

^aOf this amount the examiners voted Oct. 16, 1901, to pay to the members of the question committee other than the secretary a per diem allowance of \$10, when in session on call of the Regents, (Drs Gifford, Fowler, Tiel and Smith \$10 each) and to Dr Lewi \$300 per year.

Traveling expenses of examiners.....	\$272 42	
W. W. Pottér, allowance for expenses as president, voted by board Jan. 29, 1900, for year ending June 30, 1903.....	200 ..	
		\$1 314 90
		\$8 229 51

\$1175.64 was apportioned to four examiners and \$1175.65 to three.

Medical examinations

Medical license. Examinations for license to practise medicine in this State have been or are to be held as follows:

Dates	
1903	1904
January 27-30	January 26-29
May 19-22	May 17-20
June 23-26	June 21-24
September 29-Oct. 2	September 27-30

Places

New York, Albany, Syracuse, Buffalo. Each candidate is notified as to exact place.

Daily program

9.15 a. m.	1.15 p. m.
<i>Tuesday</i> Anatomy	Physiology and hygiene
<i>Wednesday</i> Chemistry	Surgery
<i>Thursday</i> Obstetrics	Pathology and diagnosis
<i>Friday</i> Therapeutics	

Medical students in New York State (excluding graduate schools).

In 1903 there were 795 students in College of Physicians and Surgeons, 396 in Cornell University Medical College, 311 in University-Bellevue Hospital Medical College, 266 in Long Island College Hospital, 236 in University of Buffalo Medical Department, 165 in Albany Medical College, 140 in Syracuse University College of Medicine, 105 in New York Homeopathic Medical College and Hospital, 104 in Eclectic Medical College, 34 in New

York Medical College and Hospital for Women; total undergraduate medical students 2552, graduate students 1055, making a total of 3607 medical students in the State not including summer students.

Medical school summaries [for further details *see* Appendix, 15]. In 1893 the 15 institutions employed 704 officers of instruction for 3367 students (classed as graduates 881, in the M.D. course 2352, unclassified 134); in 1903 the 13 institutions employed 1179 officers of instruction for 3722 students (classed as graduate 1063, in M.D. course 2525, unclassified 134).

In 1893, 1302 students held 1302 degrees, and M.D. degrees were conferred on 626; in 1903, 1575 students held 1575 degrees, and M.D. degrees were conferred on 513.

In 1893 the libraries of the 15 institutions contained 13,343 volumes, total property amounted to \$3,463,230, receipts \$341,540, expenditures \$689,419; in 1903, the libraries of the 13 institutions contained 30,285 volumes, total property amounted to \$6,543,642, receipts \$520,065, expenditures \$493,810.

In comparison with 1893 the medical schools of the State show for 1903 two fewer institutions, 475 more officers of instruction, 355 more students (classed as graduates 182, in M.D. course 173). There were 273 more in attendance with degrees and 113 fewer M.D. degrees conferred. The number of volumes in the libraries shows an increase of 16,942, total property increased \$3,080,412, receipts \$178,525, expenditures decreased \$195,609.

Results of medical licensing examinations [for details of New York schools *see* Appendix, 16].

An analysis of the results of the licensing examinations since Sep. 1, 1891, shows:

That 8.9% of the old school candidates were rejected in 1892, 7.4% in 1893, 20.2% in 1894, 26.5% in 1895, 27.7% in 1896, 24.8% in 1897, 24.9% in 1898, 18.6% in 1899, 22.2% in 1900, 22.08% in 1901, 17.8% in 1902, and 15.7% in 1903.

That 25% of the homeopathic candidates were rejected in 1892, 9.5% in 1893, 13.7% in 1894, 13.3% in 1895, 19.6% in 1896, 17.7% in 1897, 27.7% in 1898, 23.5% in 1899, 17.1% in 1900, 16.2% in 1901, 13.2% in 1902, and 4.6% in 1903.

That 50% of the eclectic candidates were rejected in 1892, 28.5% in 1893, 50% in 1894, 9.09% in 1895, 5.5% in 1896, 23% in 1897, 20.8% in 1898, 36.6% in 1899, 24.4% in 1900, 24.5% in 1901, 50% in 1902, and 34.7% in 1903.

During the 12 years 56, 267, 390, 606, 714, 772, 809, 738, 710, 671, 610^a and 667^a old school candidates have been examined, 8, 21, 51, 60, 56, 45, 36, 68, 58, 58, 53^a and 43^a homeopaths, and 4, 7, 4, 11, 18, 13, 24, 30, 24, 20, 22^a and 46^a eclectics, making a total of 7790, of whom 1629 or 20.9% were rejected.

In these statistics each candidate who fails is counted as often as examined, though the failure is not charged more than once against the medical school unless the examinations are taken in different years.

Comparison of medical schools in New York and other states and countries

Table [see Appendix, 17] shows for 1903 the rejections by topics: group 1, New York schools; group 2, schools in other states; group 3, schools in foreign countries. Each applicant is counted only once in the number of candidates, but under the several topics each failure is indicated, excluding any answer papers not examined.

Of the papers submitted by 399 graduates of New York schools only 70 were rejected, while 83 of those submitted by 99 graduates of schools in other states, and 125 of those submitted by 50 graduates of schools in foreign countries, were rejected. In addition to these candidates from schools in which there was at least one failure, 35 graduates of 3 New York schools and 104 graduates of 46 schools in other states and countries were examined.

Average number of trials to each New York school candidate. Table 18 [see Appendix] also gives the number of candidates and the number of trials for each year and the per cent still rejected. By this table candidates appearing in different years are counted only once.

^aNot including candidates taking partial examination.

*Summaries of minutes of state boards of medical examiners***Annual meeting of examiners representing the Medical Society of the State of New York***Regents Office, Albany N. Y. Jan. 26-29, 1903**Present*—All members.

Voted, That the full report as read by the secretary be printed and sent to every member of the Medical Society of the State of New York and to other persons suggested by Secretary Parsons or by the secretary of the board.

The following abstract of the report was ordered read before the Medical Society of the State of New York:

I am instructed by the State Board of Medical Examiners representing the Medical Society of the State of New York to present to you an abstract of its annual report for the academic year as follows:

Total number of candidates for license since the establishment of the boards	7 034
Successful	5 528 or 78.5%
Unsuccessful	1 506 or 21.4%
Total number of candidates from July 31, 1901, to Aug. 1, 1902	928
Of these there applied for full license of which number 558 were successful.	685

Of the above number, 601 took the full examination at one time. 84 of the number had previously passed in the primaries and were examined only in so called practical branches.

Of the above number appearing before this board, 17.8% were rejected.

Of those appearing before the homeopathic board, 13.2% were rejected.

Of those appearing before the eclectic board, 50% were rejected.

The above candidates for license appeared as follows:

Before this board	610	successful	501
Before the homeopathic board	53	successful	46
Before the eclectic board	22	successful	11

Candidates for the primary examinations, viz in anatomy, physiology and hygiene and chemistry, who had studied these subjects for two years, appeared as follows:

Before this board	318	successful	314	99%
Before the homeopathic board	35	successful	35	100%
Before the eclectic board	5	successful	5	100%

The average rejections in each of the seven topics was 47.

The minimum rejections for the year, 34, were in obstetrics; the maximum rejections for the year, 57, were in pathology and diagnosis.

The number of candidates for medical license in this State has been decreasing since 1898, at which time the maximum, 869, was reached. This year there were but 685.

During the past 11 years the average per year appearing before the state board was 586+; before the homeopathic board 46+; before the eclectic board 16+.

The advanced standards of New York State medical schools are evidently appreciated as manifested by the increasing number of undergraduate medical students in this State, 2563; an increase of 248 over last year. The graduate students number 1072, an increase of 42 over last year.

The state boards of examiners should not be compared with examining boards of the army, navy and hospital marine service. They serve different purposes; we to declare credentials sufficient, they to differentiate between those already declared competent.

The board advocates (under proper supervision and by legislative action) the additional graduate degree of D.P.H. (doctor of public health).

Shall allowance for experience be made in examination of older practitioners coming from other states and countries, exempting them from the primary branches? The board believes that some measure should be adopted to make less exacting the test for such practitioners.

The reason for nonability to reciprocate with sister states is explained because of the lower standards of the latter.

Written medical examination tests are not all that could be desired, but as administered by the Regents they are far preferable to any system of bedside examination under which the identity of the candidate is necessarily revealed.

Experience with cases now under advisement should indicate a proper rule of procedure in the recognition of credentials for admission to advanced standing in medical schools on the part of graduates of academic schools. We advise liberal treatment of these cases till such rule is formulated.

The board will again strive to have the present arrangement of topics altered to conform with methods of teaching.

I am also directed to state that the full report of the board, which after a decade of active experience, treats of various phases of medical education and of medical interest generally gleaned from that experience, is too long a document to read at

this time, and to request that this body accept the abstract of the report as here presented, with the understanding that a copy of the full report will be mailed to each member and to each delegate of the society as soon as printed; and that the report itself will appear in its proper place in the transactions of the society.

The following officers were elected to serve till Aug. 1, 1904: *president*, William Warren Potter M.D., *secretary*, Maurice J. Lewi M.D., *question committee*, George R. Fowler M.D. and Maurice J. Lewi.

Dr Lewi presented documents containing specific charges against one F. S. Temple made by John Gordon Kellas of the *Buffalo Review*. Dr Lewi stated that Dr Temple was a graduate of the Albany Medical College, but was exempt from the licensing examinations; that his diploma had been indorsed by the Regents on his removal from the county in which he originally registered.

The secretary, who had been directed to secure the opinion of the attorney general in reference to the case of Dr Temple, reported that he had been referred to Deputy Attorney General Slocum; that Mr Slocum had advised that, if the charges were put in legal form by the person making the same, it was the duty of the board to place said Temple on trial and, in answer to the communication from Dr Temple's counsel, to forward a copy of the charges; that, if the board found it inconvenient as a body to act on these charges, they might be considered by a committee duly appointed by the president at a regular meeting.

Voted, That the charges be returned for correction and that on their receipt in proper form a copy be forwarded to Dr Temple's counsel.

The secretary presented the facts in reference to the case of Dr Avila O. Boulay, and on invitation Dr Wilding and Dr Oliver appeared before the board.

Voted, That the Regents be requested to await the action of the grand jury in the case of Dr Avila O. Boulay before reporting the results of the examinations taken by him in January 1903.

Voted, That the secretary be instructed, in answer to the communications of candidate no. 301, to state that his case had been considered at a full meeting of the board without any different conclusion being reached as to the merits of his examination; that the papers on file were public records, and that full access would be given to them at any time, and that his only redress was to retake the examinations at some future time.

The secretary read a communication from the New Jersey State Board in regard to reciprocity of licensure.

Voted, That the secretary be instructed to say that the specific wording of §148 of the New York medical practice act prevents the New York boards from pursuing any policy other than that heretofore pursued in the matter of indorsement of licenses issued by other state boards.

Voted, That the request of Dr S. E. Gardiner for a reopening of his case be granted, and that a committee be appointed to consider such new charges (concerning which there is now only desultory correspondence relative to his professional conduct and moral character since the revocation of his license) as may be made against him in regular form; that a committee be appointed with power to send for persons and papers, and that Dr Gardiner be required to appear in person before such committee at such time and place as the committee may determine.

This committee was also authorized to investigate the charges preferred against Dr Temple when such charges are presented in legal form.

The president appointed as such committee Drs Beach, Potter, Lewi and Suiter.

Voted, That Secretary Parsons be requested to distribute the annual funds of the board as heretofore.

Voted, That the annual dues of \$10 to the Federation of State Boards of Medical Examiners be continued, and that the secretary be authorized to draw a voucher for the same.

Voted, That the allowance of \$200 a year to the president of the board be continued.

Voted, That the action of Jan. 29, 1900, relative to clerical assistance to the secretary was and is intended to cover clerical services performed either by himself or by an assistant, and that this monthly allowance of \$13 minimum, \$20 maximum be continued.

Voted, That the interests of higher education demand that the secondary schools of the State of New York be supervised exclusively as far as practicable by the Regents of the University of the State of New York, and that in the opinion of this board any funds appropriated by the State for secondary education should be administered by the Regents.

Voted, That the syllabus committee be abolished.

Adjourned

M. J. LEWIS

Secretary State Medical Board

Academy of Medicine, New York City, Oct. 13-14, 1903

Present—Dr Potter, *president*, Drs Fowler, Ely, Suiter, Beach and Lewis, *secretary*.

Voted, That the Regents be requested to have all candidates for licenses, as far as such a procedure is possible, use ink and pen in examination work.

Voted, That the Regents be requested to have all candidates for license write on but one side of single sheets of paper during examinations.

Adjourned

M. J. LEWIS

Secretary State Medical Board

Annual meeting of examiners representing the Medical Society of the State of New York

Regents Office, Albany, Jan. 25-27, 1904

Present—All members

The secretary presented the following report, which was ordered read at the first session of the meeting of the Medical Society of the State of New York:

During the academic year ending Aug. 31, 1903, four medical licensing examinations have been held. The total number of candidates was 1144. Of this number 529 applied for full examination, 227 appeared for the final licensing examinations, having previously successfully passed in the preliminary medical branches, and 388 appeared for partial examination.

Of this total of 756 candidates for license,
667 appeared before the state board

43 " homeopathic board

46 " eclectic board

Of this number 123, or 16.26%, were rejected.

The state board rejected	105 or 15.7%
The homeopathic board rejected	2 " 4.6%
The eclectic board rejected	16 " 34.7%

Since the creation of the boards of examiners, 7790 candidates have been examined for license, of whom 1629, or 20.09%, have been rejected.

Under exemptions in the medical law the Regents have licensed during the year 69 physicians. On recommendation of this board nine diplomas issued before the law took effect have been legally indorsed, entitling the holders to register in any county in the State.

Attempts at standardizing the medical examinations are being made, and a hopeful sign in this direction is the following communication:

William Warren Potter M.D.

President New York State Board of Medical Examiners:

SIR: You are doubtless aware that appointments to the medical departments of the army and navy have in the past been made through competitive examinations. It is the desire of this office to standardize the examinations for the medical corps of the army with relation to those of state boards, and with this object in view I would be very glad if you would inform this office of the number of medical men that have appeared before your board for examination during the past five years, and the percentage of candidates thus examined that have been successful.

I will be much gratified if you will kindly send a set of questions asked by your board which you consider a fair sample of your standard.

Very respectfully

R. M. O'REILLY

Surgeon General, United States Army

This board stands prepared to cooperate with the army authorities in the matter proposed by Surgeon O'Reilly and has so indicated.

The question of interstate reciprocity in medical licensure is still a fruitful topic for study on the part of medical educators; no plan that can be said to be fairly operative has yet been adopted by any number of similar bodies, but the trend is clearly toward the development of some system which, while practically operative, will not lower existing standards. Many difficulties still obtain. At the request of the officers of a neighboring state board of medical examiners, this board sent a representative to determine whether their methods were sufficiently advanced to have their licenses visid by the New York State authorities. The investigation showed

1 That their academic requirements were not of equal standard with those in this state;

2 That their method of conducting academic as well as medical examinations was faulty, because it brought the medical examiner and the applicant in personal communication. Hence their system of safeguarding their examinations was defective.

These points left their status with us unchanged.

The harmony which has prevailed between the three boards in this state has continued unabated. We are in hopes that at some day in the near future there will be a unification of the profession in the State of New York, thus making necessary but one board. Such was the original proposition of the Medical Society of the State of New York and the consummation of that idea seems less remote.

Voted, That Dr Suiter be instructed to pay the dues of this body to the Federation of State Boards of Medical Examiners.

The report of the subcommittee to which was referred the petition of Sheridan E. Gardiner was presented, and it was

Voted, That the board does not see its way clear at this time to alter its action whereby Dr Gardiner's license to practise medicine in the State of New York was suspended.

Voted, That the defaced license of William H. Lucas, issued Ap. 21, 1897, be destroyed and a new license issued.

Voted, To continue the \$200 annual allowance to the president of the board for expenses.

The following officers were elected to serve till Aug. 1, 1905: *president*, William Warren Potter M.D.; *secretary*, Maurice J. Lewi M.D., question committee, George Ryerson Fowler M.D., M. J. Lewi.

Adjourned

M. J. LEWI

Secretary State Medical Board

Annual meeting of examiners representing the Homeopathic Medical Society of the State of New York

Regents Office, Albany, Feb. 10, 1903

Present—President Lee, Drs Gorham, Gifford and Candee, also Secretary Parsons.

The minutes of the last annual and the special meetings were read and approved.

Statistics of the examinations held during the academic year 1901-2, the first under the new system of divided examinations,

were read, and divided examinations were pronounced satisfactory.

The question of leniency in examinations in certain cases was generally discussed. It was stated as being the sentiment of the old school examiners that answer papers should take the regular course. The point in question could be covered on review. Attention was directed to criticisms on the severity of the examinations and consequent hardships said to have been wrought in some instances.

Dr Lewi was quoted as stating that such criticism exists in the old school ranks. Dr Lee said the same is to be found among the homeopaths. Mr Parsons said there is now very little criticism, and that mainly from those approaching examination.

The following officers were elected to serve till Aug. 1, 1904: *president*, J. M. Lee M.D.; *secretary*, J. W. Candee M.D.

Adjourned

J. WILLIS CANDEE

Secretary Homeopathic Medical Board

**Annual meeting of examiners representing the Eclectic Medical Society
of the State of New York**

Regents Office, Albany, Ap. 8, 1903

Present—Drs Smith, Denny, Ensign, Nichols, Nolan, Tiel.

The secretary reported that 37 candidates presented 186 papers during the year, 31 of which were rejected.

6 certificates were granted on one examination, one of them gaining an honor mark; 4 certificates were granted on two trials, 3 certificates on three trials and 2 on four trials. There were 31 failures in the topics examined, as follows. Anatomy none, physiology and hygiene 8, chemistry 2, surgery 7, obstetrics 2, pathology and diagnosis 5, therapeutics, practice and materia medica 7. Total 31.

The following officers were elected for the ensuing year: *president*, Lee H. Smith M.D.; *secretary*, Arthur R. Tiel M.D.

Adjourned

ARTHUR R. TIEL

Secretary Eclectic Medical Board

Dentistry

Exchange of M.D.S. for D.D.S. May 21, 1903, on motion of Vice Chancellor Reid, the Regents voted to reconsider the action of the Board taken at its meeting of Dec. 4, 1902. June 29, 1903, Regent Fitch presented a letter addressed to himself from the deputy attorney general, and on motion it was ordered that the secretary be requested to procure this opinion from the attorney general in such form that it might be quoted in the records of the board's transactions.

[Dec. 3, 1903] Regent Fitch presented from the college committee a report on the question of the substitution of the D.D.S. for the M.D.S. degree, which was received and with the conclusion approved.

Report. The college committee to which was referred the question as to whether or not the Regents of the University shall exercise the authority vested in them, by chapter 215 of the laws of 1901, to confer on all persons who have received the degree of master of dental surgery under the laws of the State, prior to the taking effect of the law indicated, the degree of doctor of dental surgery in lieu of the master's degree, respectfully reports as follows:

Imprimis, it is pertinent to note the signal progress that dentistry has made, both as an art and a science, within recent years, availing itself of wide and well ordered curriculums and utilizing scientific discoveries and devices. Its *morale* has appreciated immeasurably. It has attained the dignity of a profession, as enlightened as practical. Its high standing today, the knowledge it possesses, the skill with which it operates, the esteem in which it is held, must be attributed largely, if not wholly, to the molding of the schools—the education they furnish, including the requisites for admission thereto, the courses prescribed and the degrees bestowed. While New York may not claim to be the pioneer in dental education—for Maryland chartered a college so early as 1839—she has been its earnest and efficient promoter and is now unquestionably the leading exponent of the best thought and the most expert practice known to the profession. She has three excellent schools—the New York College of Dentistry, the College of Dentistry of the University of Buffalo, and the New York Dental School—the first named having been incorporated in 1865 and the latter two in 1892. Each is well equipped with property, mechanical appliances and teaching faculty. The courses in each,

covering a period of three years embrace instruction in anatomy, physiology and hygiene, chemistry and metallurgy, oral surgery and pathology, operative dentistry, prosthetic dentistry, therapeutics and materia medica and histology. Each crowns the courses pursued and the examinations passed with the degree of doctor of dental surgery; and the State has wisely enacted, with certain reservations relative to those who hold a diploma or license from a foreign country or who filed a certificate of study under private preceptorship on or before July 1, 1895, that no person shall be licensed to practise dentistry therein who has not had a preliminary education equivalent to three years in a registered high school, and for matriculants after Jan. 1, 1905 to graduation from a four year high school course registered by the Regents, and unless he has either been graduated in course with a dental degree from a registered dental school, or else, having in course been graduated from a registered medical school with the degree of doctor of medicine, has pursued thereafter a course of special study of dentistry, for at least two years, in a registered dental school and received therefrom its degree. Such are the prescriptions of the schools and such the safeguards that the State has provided against ignorance and incompetency.

What a contrast is revealed between the schools thus established and the profession thus munimented by law and the dental vocation of half a century ago, untutored, irresponsible and bungling, redeemed only from absolute contempt by the few who had had the training of the schools or by diligent study and exceptional talent had acquired proficiency outside of them. So late as June 3, 1876, the London *Lancet* said, "it appears that not much more than 50 of all the numerous body of so called dentists of the United Kingdom possessed in reality any medical or surgical diploma at all."

In this State, till 1868, the profession of dentistry, if by courtesy it could then be styled a profession, was disorganized and demoralized, without cohesion of its reputable membership and without requirements for admission to it which would shield it from pretension and charlatanry. Quacks and butchers, equally with learned, accomplished and upright practitioners, could hang out their signs and solicit patronage. Reform came from within the body itself, its intelligent and conscientious control, and at its instance the law of 1868 was enacted. Under that law, the state and district societies were organized and authority was given to the State to confer the degree of master of dental surgery and to license persons passing a satisfactory examination before a board of censors, and whose eligibility as to moral character and preparation of four years in the study of dentistry was certified to the

board by a district society. The board of censors, throughout its entire existence, was admirable both in its personnel and procedure. Its members were of the best repute, and it is impossible to examine the proceedings, as your committee has had the privilege of doing, without sincere respect for its capacity, fidelity to duty and high-mindedness. Its examinations were severe ordeals. Its records show that of 321 applications for the degree of master of dental surgery, 160 were granted and 161 were rejected, among the latter being several from holders of the degree of doctor of dental surgery. The degree of master of dental surgery is one honorably acquired and worthily worn, justifying doubtless, the opinion of Dr W. C. Barrett, dean of the dental department of the University of Buffalo, who says: "It carries with it something more than mere theoretic knowledge. It is a voucher for professional standing, for ethical conduct, for experience and place in the councils of the profession."

Meanwhile the college degree appreciated in significance and favor as the colleges enlarged and strengthened their curriculums, and it was clearly seen that the proper approach to the profession was through the avenue of the college; and from the same inspiration that constrained the law of 1868 came the law of 1895, which resolved the censors into the state board of examiners and made it appointive by the Regents, on the nomination of the State Dental Society, imposed, as conditions precedent, on persons presenting themselves before the board for examination, that they should have had a preliminary education equivalent to a high school course and been graduated with a dental degree from a registered dental school, and empowered the Regents to license those thus qualified to practise dentistry, on the certificate of the board of examiners, that they had passed successfully its examinations. Clearly, it was the purpose of this law, a marked advance in its sanctions over that of 1868, to compel the teaching of the schools instead of that of private preceptors and to attach value to the college degrees, as it was also clearly the purpose to make the Regents the conservators, if not the grantors, of these degrees. By definition and elimination the degree of doctor of dental surgery is the adopted and authoritative college degree in dentistry throughout the United States, the exceptions being those of Harvard University, which grants the degree of D.M.D. (*dentariæ medicinæ doctor*) and the University of Minnesota.

No other is recognized in New York, that of B.D.S., which for a time was issued by one institution, having some years since been abolished. It means what it says, that it is a college degree. It stands for a three years' residence and for the courses pursued in a college: and of the comparative worth of a New York college

degree it is well to note that in 1901, of the 113 papers submitted to the New York board of examiners by graduates of New York schools, but 16 failed of approval, while 23 of the 46 written by graduates of schools in other states were rejected. It is not, indeed, without much of agitation and something of conflict that the integrity of the degree in American dental colleges has been assured. In earlier years, on pressure on them, they frequently granted it as a "reward of merit," or "recognition of service"—as an honorary appellation—but when a union of the dental faculties of the country was effected, in 1884, the sentiment against conferring it, except at the end of a college course had become paramount, and in 1890 the rule was made imperative against it, no violations of the same having occurred save that in 1892 one dental school ventured to transgress it and was rebuked sharply therefor, and the University of Buffalo in 1893, and the University of Pennsylvania in 1894, probably in ignorance disregarded it, both however, rescinding their action promptly at the demand of the Faculties Association. From the first, the Regents have refrained studiously from bestowing honorary degrees, except on rare occasions and on those eminently deserving, and they have also refused to grant as honorary a degree which has been designated by the colleges or universities of the State as one to be earned at their hands by residence and study. The Regents do not confer the degrees of bachelor of arts, or science, or letters, nor that of doctor of philosophy. For some years they did confer the last named degree, but at the unanimous request of the colleges and universities, they have ceased to do so, and that on the principle stated. For some years also, the Regents conferred the degree of doctor of medicine on the persons nominated to them by the state societies of the various medical schools respectively, but this was but the confirmation of the same degree previously obtained by them from the colleges, differing essentially from the exchange of dental degrees now proposed, and even this prerogative of the Regents has now been abrogated.

Conclusion. In view of the foregoing considerations, the conclusion of the committee is that the proposed substitution of the D.D.S. for the M.D.S. degree is undesirable because tending to weaken the standing of college degrees.

Voted, That the secretary be directed to transmit a copy of the report and action of the Regents to the secretary of the New York State Dental Society, to the secretary of the State Board of Dental Examiners, and to the dean of each of the dental schools of the State for their information respectively.

Resolved, That the report, with accompanying conclusion, be printed in full in the report of the College Department for 1903.

Dental examiners. In accordance with the law nominations were submitted to the Regents from the Dental Society of the State of New York, and examiners were appointed May 21, 1903, for the ensuing year.

Appointments. Frank French M.D.S., Rochester, O. J. Gross D.D.S., Schenectady, and A. R. Cooke D.D.S., Syracuse, to fill the vacancy in the unexpired term ending July 1, 1904, caused by the death of Dr S. B. Palmer, Syracuse.

Pennsylvania license. Pursuant to section 168, chapter 215, laws of 1901, the Regents, on recommendation of the Board of Dental Examiners, agreed to issue their license to any applicant therefor who holds a license to practise dentistry granted by the State Board of Dental Examiners of Pennsylvania which had been indorsed by the Dental Society of the State of New York, provided that his preliminary and professional education has been not less than that required in this State.

Agreement. 1 It is understood and admitted that the standard of the professional examination of each board is practically equal, and though different in detail is mutually acceptable.

2 Licentiates of the Pennsylvania board, who have received the degree of D.D.S. or other recognized dental degree, are to be granted licenses to practise in New York State without examination on payment of the regular licensing fee, provided the preliminary education of the candidate is equal to that required by the New York statute; and licentiates of the New York board are to be granted licenses to practise in Pennsylvania under the same conditions.

3 Immediately after any examination by either board complete sets of the questions used shall be mailed to the examiners of each state, to the Dental Council of Pennsylvania and to the Regents of the University of the State of New York.

4 Applications for license under this interchange shall be indorsed, in New York State by the president and secretary of the board of examiners and by the secretary of the Regents, and in Pennsylvania by the president and secretary of the examining board and by the secretary of the Dental Council and shall be accompanied by the original or certified copies of certificates of preliminary education.

5 The names of unsuccessful candidates in each state shall be sent to the secretaries of the examining boards, and to the Regents or Council as the case may be.

6 All papers connected with the examinations shall be placed *on file* with the Regents or council, and shall be public records.

7 Those who have received a New York State license to practise dentistry granted since 1895, or a Pennsylvania license granted since 1897 may apply for the interchange established by this agreement.

Action by the director. Dec. 1, 1903, the following letter was addressed to the deans of the dental schools of the United States:

We are carefully reregistering the dental schools of the United States, and our attention has been called to the fact that some of the schools are not meeting the requirements of the National Association of Dental Faculties or of the ordinances of the University of the State of New York, in that dental students are not required to attend the entire final year of the course for graduation.

The standing resolution of the National Association of Dental Faculties (4) reads:

"A graduate of a recognized dental college . . . shall complete one full course of instruction in said college and comply with all the other requirements of the senior class."

The special committee of the State Board of Dental Examiners is unanimous in the opinion that this rule should be strictly adhered to in the registration of dental schools. Kindly inform me whether or not your dental school adheres strictly to this rule in all cases.

Very truly yours

JAMES RUSSELL PARSONS JR

Registration of dental schools [see Appendix, 19]. The dental schools of the United States registered or accredited by the University of the State of New York fall into two groups.

Group 1. Those registered or accredited for admission to the licensing examination after application authenticated by seal or affidavit and the signature of the executive officer [for list in force Ap. 1, 1904, see Appendix].

Group 2. Those registered or accredited for admission to registered dental schools.

The registration of the dental schools has reference to the professional education requirement and not to the general preliminary education requirement which must be met by candidates for admission to New York dental schools and receives independent action.

Schools are registered in full or accredited in two classes on

the same principles that apply to the registration of medical schools.

Dental Council's recommendations. Feb. 20, 1903, the Dental Council met in New York, all members being present. After full discussion the following recommendations were made, based on a four year course which goes into effect October 1903: (1) That the state laws be amended (if necessary) so as to permit final examinations in certain (appropriate) subjects of the state board examinations for license to practise, at the end of the third year; the remainder of the licensing examinations to be taken at the end of the fourth year. (2) That, beginning with students matriculating for the session of 1903-4, all students be required to have 24 academic counts before the beginning of the second year and the full 36 counts before the beginning of the third year.

FANEUIL D. WEISSE M.D. *President*

CHARLES MILTON FORD M.D. *Secretary*

Dental receipts and disbursements. Oct. 1, 1903, the secretary sent to the eight state dental examiners the following statement of receipts and expenditures connected with the administration of the dental laws from July 1, 1902, to June 30, 1903.

To the State Board of Dental Examiners

I transmit herewith a summary of the records and vouchers in this office (all of which are open to your inspection) of the receipts and expenditures connected with the administration of the dental laws, but not including the dental student examinations, the expenses of which are borne by the University.

From July 1, 1902, to June 30, 1903, there were four examinations for license to practise dentistry, at which 217 candidates appeared. In accordance with the law the Regents have paid the expenses properly chargeable to these tests and have on hand at the close of the academic year \$620.48, which according to law is to be paid to the Dental Society of the State of New York.

JAMES RUSSELL PARSONS JR

Secretary of the University

Receipts

231	\$25 fees	\$5 775 ..	
14	\$25 fees returned	350 ..	
			\$5 425 ..

Payments

Parchment and engraving 699 licenses	\$629 10
Printing	48 28
Local expenses of conducting examinations at various points throughout the State	192 19
Services of examiners and clerks in Albany	1 556 90
Paper, pencils and binding	117 52
¹ Expenses of State Board of Dental Exam- iners	2 260 53
	\$4 804 52
	\$620 48

Dental examinations

Dental license. Laws of 1901, chapter 215, provide for dentists' requirements as to license and registration similar to those fixed by law for physicians.

Examinations for license to practise dentistry in this State have been or are to be held as follows:

Dates

1903	1904
January 27-31	January 26-30
May 19-23	May 17-21
June 23-27	June 21-25
September 29-October 3	September 27-October 1

Places

New York, Albany, Syracuse, Buffalo. Each candidate is notified as to exact place.

Daily program

	9.15 a. m.	1.15 p. m.
<i>Tuesday</i>	Anatomy	Physiology and hygiene
<i>Wednesday</i>	Chemistry and metal- lurgy	Oral surgery and pathology
<i>Thursday</i>	Operative dentistry	Prosthetic dentistry
<i>Friday</i>	Therapeutics and ma- teria medica	Histology
<i>Saturday</i>	Practical examination in prosthetic den- tistry	

¹Dr Jarvie \$193; Dr Wright \$196.50; Dr Holmes \$376.82; Dr Gross \$175.96; Dr Burkhart \$363.27; Dr Carr \$244; Dr Cooke \$91.49; Dr Palmer \$121.17; Dr French \$498.32.

Dental students in New York State. In 1903 there were 488 students in New York College of Dentistry, 278 in University of Buffalo College of Dentistry, and 137 in New York Dental School, total 903.

Dental school summaries [for further details *see* Appendix, 20]. In 1893 the three institutions employed 69 officers of instruction for 328 students (classed as graduates 8, in D.D.S. course 320); in 1903 the three institutions employed 115 officers of instruction for 903 students (classed as graduates 22, in D.D.S. course 787, unclassified 94).

In 1893, eight students held degrees, and D.D.S. degrees were conferred on 52; in 1903, 19 held degrees, and D.D.S. degrees were conferred on 124.

In 1893, the libraries of the three institutions contained 150 volumes, total property amounted to \$123,996, receipts \$34,268, expenditures \$36,180; in 1903 the libraries contained 235 volumes, total property amounted to \$247,067, receipts \$145,364, expenditures \$133,475.

In comparison with 1893 the dental schools of the State show for 1903, 46 more officers of instruction, 575 more students (classed as graduates 14, in D.D.S. course 467, unclassified 94). There were 11 more in attendance with degrees, and 72 more D.D.S. degrees were conferred. The number of volumes in the libraries shows an increase of 85, total property \$123,071, receipts \$111,096, expenditures \$97,295.

Dental licensing examinations. The results of the dental licensing examinations [for further details *see* Appendix, 21] from 1896 to 1903 show that the per cent of rejected candidates has steadily decreased, while the number of honor licenses issued has as steadily increased.

Comparison of dental schools. The dental schools of New York State compare favorably with those of other states as shown by the licensing examinations [for further details *see* Appendix, 22]. The table shows for 1903 the rejections by topics: group 1, New York schools; group 2, schools in other states. Each applicant is counted only once in the number of candidates, but under the

several topics each failure is indicated, excluding any answer papers not examined. Of the papers submitted by 118 *graduates of New York schools only 37 were rejected, while 21 written by 41 graduates of schools in other states were rejected.* In addition to the above, 23 candidates had filed evidence of study under private preceptor before Aug. 1, 1895, 13 of whose papers were rejected, and 17 candidates were graduates of schools against which no failure was charged in 1903.

Summaries of minutes of State Dental Examiners

Regents Office, Albany N. Y. May 13, 1903

Meeting called to order at 9 a. m., all members of the board being present, also Secretary Parsons of the Regents office.

Dr Holmes was elected acting president for the unexpired term of Dr Palmer.

The minutes of the previous meeting were read by Dr French and formally approved.

Dr Carr made a statement concerning Charles L. Apfel and submitted a signed confession from said Apfel.

Recommended, That Charles L. Apfel be permitted to take Regents examinations as a candidate for a law student certificate.

Dr Carr stated that to his certain knowledge many plates submitted in prosthetic dentistry were not made by the candidates themselves as is required, in spite of their affidavit to that effect, and cited one or two cases that had come directly to his knowledge.

Voted, That the examiner in prosthetic dentistry require an affidavit not only from the candidate but also from the demonstrator in the school or from the one in whose laboratory the work was performed stating that the plate was made by the candidate under his immediate supervision.

Interchange of licenses. Dr Carr stated that he and Dr Jarvie had had a conference with the New Jersey board, which favored interchange of licenses, but felt that certificates of preliminary education furnished by their candidates should be accepted at face value.

Mr Parsons said that under the laws and Regents rules a uniform interpretation of credentials covering preliminary education was essential, and that the Regents could insure this only by considering in each case original credentials or certified copies.

Dr Jarvie stated that he and Dr Carr had had a conference with the Pennsylvania board of examiners and that articles of agreement had been drawn up regarding an exchange of licenses between New York and Pennsylvania.

This agreement was subsequently amended and approved as appears at p. 136.

Voted, That Drs Carr and Jarvie, with the approval of Secretary Parsons, be empowered to enter into an agreement with Pennsylvania on the basis of the proposed articles.

Divided examinations. Dr Jarvie stated that some of the schools thought that, inasmuch as the students completed certain subjects at the end of their first or second year, they should then be examined in those subjects. After some discussion of this matter it was

Voted, That the consideration of the question of divided examinations be deferred for the present.

Voted, That all members of the board consider themselves delegates to the meeting of the National Association of Dental Examiners, and that the annual dues of \$10 be paid from the general fund.

Dr Jarvie presented the following resolutions on the death of Dr Palmer, which were unanimously adopted:

To the New York State Board of Dental Examiners

GENTLEMEN: The committee appointed to prepare a minute on the death of our fellow member and president, Dr Palmer would report as follows:

Died at his home in Syracuse, on Monday, Mar. 30, 1903, 1 Stewart Bailey Palmer, in the 81st year of his age.

Dr Palmer was born in Pompey, now Lafayette, in this State on Sep. 1, 1822. In 1848 he entered the office of Dr John Allen in Fabius as a student, and in 1850 began the practice of dentistry in Lafayette. In 1851 he moved to Tully and remained there until 1856 when he moved to Syracuse and associated him-

with Dr Amos Westcott. In 1868 he severed his connection with Dr Westcott and till a short time before his death continued to practise in that city.

Dr Palmer was one of the original members of the State Dental Society and was the first to have conferred on him the degree of master of dental surgery, M.D.S., in July 1869. In 1873 he was elected a member of the State Board of Censors and, when that board went out of existence in 1895 and became the State Board of Dental Examiners, connected with the University of the State of New York, he remained as a member of it. In 1898 he was elected president of the board and continued as such till his death.

Dr Palmer was of a most gentle and lovable disposition, always tolerant of the views of others yet firm in his own convictions, as was shown in the controversy which was carried on for years regarding what was known as "the new departure." Ever a student, particularly of chemistry in its relation to dentistry, this board has had the benefit of his intimate knowledge of that branch of science in its examinations.

In the death of Dr Palmer each member of our board has lost a beloved friend; the examining board one of its most efficient and faithful members; and we shall sadly miss his genial presence at our meetings.

Resolved, That this minute be entered in full on the records and a copy of it sent to the family of Dr Palmer.

WILLIAM JARVIE
Committee

FRANK FRENCH
Secretary

Adjourned

Annual meeting

Regents Office, Albany N. Y. Oct. 3, 1903

Meeting called to order at 9.15 a.m., all members of the board being present, also Secretary Parsons of the Regents office.

The minutes of the previous meeting were read by Dr French and approved.

Dr Jarvie stated that the committee on interchange of licenses had completed arrangements for an interchange of licenses with Pennsylvania on the basis of the agreement set forth in the minutes of the preceding meeting and that such interchange was now in operation.

Voted, That the action of the committee be approved.

Dr Jarvie stated further that, at the meeting of the National Association of Dental Faculties held at Asheville N. C. July 27, the following resolution was adopted:

That an interchange of license to practise dentistry be and is hereby recommended to be observed by the various state boards on the following specific conditions: Any dentist who has been in active practice for five years or more, is a reputable dentist, is a person of good moral character, and is desirous of making a change of residence, and has in his possession already a certificate, may apply to the board of the state in which he is a resident for a new certificate, which certificate if granted may be deposited with the examining board of the state in which he proposes to reside, and said board in lieu thereof may grant him a certificate allowing him to practise.

He stated that it was published in the dental journals that this resolution had been passed by the New Jersey board and that two states, Ohio and Indiana, had already entered into an agreement on this plan. He raised the question as to whether New York wanted an interchange with other states on these conditions. After some discussion it was

Voted, That the interchange committee be instructed not to enter into arrangements for an interchange with any state which accepts licenses on the above conditions.

Voted, That the New York State Board of Dental Examiners is desirous of entering into an interchange agreement with any other state that meets the New York standard.

The following officers were elected for the ensuing year: *president*, Dr A. M. Holmes, *secretary*, Dr Frank French, *editor*, Dr William Carr.

The board then discussed the question of combined medical and dental courses and it was

Voted, That in the opinion of the board where a dental school has university connections and where the work for the first one or two years of the course is identical, the law permitting, the two degrees of M.D. and D.D.S. should not be secured in less than five years; that in other schools the combined course should be completed in not less than six years.

Drs Jarvie and Carr were appointed a special committee on the registration of dental schools.

Adjourned

FRANK FRENCH

- Secretary

Veterinary medicine

Registration of veterinary medical schools [see list Appendix, 23]. The veterinary medical schools of the United States registered or accredited by the University of the State of New York fall into two groups.

Group 1. Those registered or accredited for admission to the licensing examination after application authenticated by seal or affidavit and the signature of the executive officer [for list in force July 1, 1904, see Appendix, 23].

Group 2. Those registered or accredited for admission to registered veterinary medical schools.

The registration of the veterinary medical schools has reference to the professional education requirement and not to the general preliminary education requirement which must be met by candidates for admission to New York veterinary medical schools and receive independent action. Schools are registered in full or accredited in two classes on the principles that apply to the registration of medical schools.

Veterinary medical receipts and disbursements. Oct. 1, 1903, the secretary sent to the New York State Veterinary Medical Examiners the following statement of receipts and expenditures connected with the administration of the veterinary medical laws from Aug. 1, 1900, to July 1, 1903:

To the State Veterinary Medical Examiners:

The statement of receipts and expenditures connected with the administration of the veterinary laws from Aug. 1, 1900, to July 1, 1901, showed a balance of \$41.42, but as this amount was not sufficient to cover postage, express and other necessary office expenses, it was held on hand.

Between July 1, 1901, and July 31, 1903, the Regents received 39 fees of \$10 each, of which number 4 were returned, making the total net receipts for the period \$350.

For printing the bills amounted to \$32.29, and for conducting examinations, to \$88.12, making total disbursements of \$120.41. Deducting this amount from the net receipts leaves a balance of \$271.01, which obviously does not cover the office expenses, postage, express, parchment and engraving licenses, and equitable parts of salaries of clerks conducting the correspondence and

handling the records. Nevertheless, it seems just to allow the examiners half, partly covering postage, express and necessary traveling expenses in performance of their official duties.

JAMES RUSSELL PARSONS JR

Secretary of the University

Receipts

Balance July 1, 1901	\$41 42	
39 \$10 fees	390 ..	
	\$431 42	
4 \$10 fees returned	40 ..	
		\$391 42

Payments

Printing	\$32 29	
Local expenses of conducting examinations at various points throughout the State	88 12	
Part of necessary expenses at Albany	135 50	
		255 91
Apportioned		
		\$135 51

Veterinary examinations

Veterinary license. Laws of 1893, chapter 661, as amended in 1895, 1896, 1900 and 1901, provide for veterinary requirements as to license and registration similar to those fixed by law for physicians.

Examinations for license to practise veterinary medicine in this state have been or are to be held as follows:

Dates

1903	1904
January 27-30	January 26-29
May 19-22	May 17-20
June 23-26	June 21-24
September 29-Oct. 2	September 27-30

Places

New York, Albany, Syracuse, Buffalo. Each candidate is notified as to exact place.

Daily program

	9.15 a. m.	1.15 p. m.
<i>Tuesday</i>	Comparative anatomy	Physiology and hygiene
<i>Wednesday</i>	Chemistry	Veterinary surgery
<i>Thursday</i>	Obstetrics	Pathology, diagnosis and practice
<i>Friday</i>	Therapeutics and materia medica	

Veterinary medical students in New York State. In 1903 there were 251 students in the New York State Veterinary College and 58 in the New York American Veterinary College, total 309.

Veterinary school summaries [for further details *see* Appendix, 24]. In 1893 the two institutions employed 31 officers of instruction for 224 students (classed as graduates 1, in veterinary course 223); in 1903 the two institutions employed 50 officers of instruction for 251 students (classed as graduates 3, in course 120, unclassified 128).

In 1893, two students held degrees, and veterinary degrees were conferred on 73; in 1903, 12 students held degrees, and veterinary degrees were conferred on 24.

In 1893, the libraries of the two institutions contained 600 volumes, total property amounted to \$30,750, receipts \$14,120, and expenditures \$14,120; in 1903 the libraries of the two institutions contained 3451 volumes, total property amounted to \$158,191, receipts \$34,679, expenditures \$32,997.

In comparison with 1893, the veterinary schools show for 1903 the same number of institutions, 19 more officers of instruction, 27 more students (classed as graduates 2, unclassified 128 and in veterinary course 103). There were 10 more in attendance with degrees and 49 fewer veterinary degrees conferred. The number of volumes in the libraries shows an increase of 2851, total property increased \$127,441, receipts \$20,559, expenditures \$18,877.

Veterinary licensing examinations. The results of these examinations [for details *see* Appendix, 25] from 1896 to 1903 show a steady decrease in the per cent rejected and a gradual increase

in the licenses issued. In 1903 the first honor licenses (two) were issued.

Nursing

The act. Ap. 27, 1903, the law took effect which amended the public health law by inserting article 12, entitled Registration of Nurses.

Section 206 provides that any resident of the State of New York 21 years of age, of good moral character, holding a diploma from a training school for nurses connected with a hospital or sanatorium giving a course of at least two years and registered by the Regents of the University of the State of New York as maintaining in this and other respects proper standards, and receiving from the Regents a certificate of his or her qualifications to practise as a registered nurse, shall be styled and known as a registered nurse, and no other person shall assume such title or use the abbreviation R. N.; that before beginning to practise nursing every registered nurse must record the certificate in the county clerk's office of the county of his residence; that during January 1906 and every 36th month thereafter certificates must be recorded with proof of identity; that nothing in this article confers any authority to practise medicine.

Section 207 provides for a board of five examiners appointed by the Regents from 10 nominees of the New York State Nurses Association.

Section 208 provides that the Regents may on the recommendation of the board waive the examination of residents of the State, 21 years old, of good moral character, (1) that have graduated from a training school for nurses registered by the Regents before Ap. 27, 1903, or are in training on that date and graduate thereafter; (2) that had three years' experience in a general hospital prior to Ap. 27, 1903, and were practising nursing on that date, who apply in writing for the certificate prior to Ap. 27, 1906; (3) that were engaged in the actual practice of nursing for not less than three years next preceding Ap. 27, 1903, that satisfactorily pass an examination in practical nursing before Ap. 27, 1906.

Board of examiners. In accordance with the law, nominations were submitted to the Regents from the New York State Nurses Association as follows: Miss Annie Damer, Miss Mary E. Thornton, Miss Julia E. Bailey, Miss Sophia F. Palmer, Mrs Sophia S. Camman, Mr L. Bissell Sanford, Dr Mary McMillan, Miss Dorothea M. Macdonald, Miss Jane E. Hitchcock, Miss Anna O'Neill.

Appointments: for one year L. Bissell Sanford, for two years Miss Annie Damer, for three years Miss Dorothea M. Macdonald, for four years Miss Sophia F. Palmer, for five years Miss Jane Elizabeth Hitchcock.

Requirements for registration in force Jan. 1, 1904-6

Incorporation. The training school for nurses or the institution of which it is a department must be incorporated.

Hospital facilities. For registration a nurse training school must be connected with a hospital (or sanitarium) having not less than 25 beds and the number of beds must be from two to four times the number of students in the school, depending on the character of the hospital's facilities for private or ward practice.

Preliminary education. All training schools registered by the Regents of the University of the State of New York shall require of pupils applying for admission a certificate of graduation from a grammar school or its equivalent, preference being given to applicants who have had one year or more in a high school and to those who have taken a full course in domestic science in a recognized technical school.

Subjects of state examination. Training schools for nurses registered by the Regents shall provide both practical and theoretical instruction in the following branches of nursing: (1) medical nursing (including materia medica), (2) surgical nursing, with operative technic including gynecological, (3) obstetrical nursing (each pupil to have had the care of not less than six cases), (4) nursing of sick children, (5) diet cooking for the sick including (a) 12 lessons in cooking in a good technical school, or with a competent diet teacher, (b) food values, and feeding in special cases, to be taught in classes not by lectures, (6) a thorough course of theoretical instruction in contagious nursing where practical experience is impossible.

Training schools for male nurses shall provide instruction in genito-urinary branches, in place of gynecological and obstetrical nursing.

Professional education. The period of instruction in the training school shall be not less than two full years, during which time students shall not be utilized to care for patients outside of a hospital. Training schools giving a three year course and wishing to continue the practice of utilizing their pupils to earn money for the hospital may send them out to private cases or for district work among the poor for a period not exceeding three months in the third year of their course. But training schools with a two year course wishing to continue the practice must extend their course to meet the above requirements.

Provisional requirements. The branches of nursing in which both practical and theoretical instruction must be given by training schools applying for registration will remain in force till Jan. 1, 1906.

Suggested lines of development

Preliminary education. After Jan. 1, 1906, all registered training schools for nurses must require the completion of one year of a high school course subsequent to an eight year grammar school course, or the equivalent.

Professional education. The elaboration of the curriculum to be developed by January 1906 and the lines on which this development may be expected, are:

Preliminary training. The training schools should teach their probationers before placing them at the bedside of patients:

a The various methods of making and changing the bed, with and without the patient;

b The temperature of baths, and the simple methods of administering them;

c The use and dangers of the hot water bag;

d The principles of sweeping and dusting;

e The setting of trays, etc.

This instruction can be given easily in the nurses home by the superintendent of nurses or by a delegated nurse. Instruction in these simple principles can not be given uniformly in the rush and pressure of busy wards. It demands no additional service or expense on the part of the hospital and tends toward the preliminary training that is rapidly gaining favor in the schools of higher grade. It is not intended as a substitute for the bedside instructions, but as a preparation for it. The patient should not be required to wait for an ordered poultice till the head nurse can show the probationer how to make one. Many similar facts can be taught separately the final and all important part coming at the bedside when these bits of deftness are applied to the relief and not to the embarrassment of the patient. Preliminary training in the leading schools covers a period of from one to six months, but the simple practical instruction here suggested is given in many schools that do not profess to have a regular preliminary course.

Small classes. In place of the elaborate system of lectures given gratuitously by members of the medical staff, training schools should adopt more advanced methods, affording instruction in the same subjects to smaller classes by competent teachers and clinical demonstrations by members of the medical staff. Many schools publish an elaborate lecture course, but being dependent on busy medical men such instruction is frequently and unavoidably not given, to the great injustice to the pupil in training. Instruction in small classes in many schools unable to provide paid teachers is given by the younger medical men affiliated with the hospital, who teach such subjects as bacteriology, anatomy, physiology, materia medica and chemistry, while the more important subjects of the care and management of acute cases are reserved for members of the regular staff.

The State Board of Nurse Examiners as organized for 1903-4 with the year when the appointment expires and the address of each examiner is given for convenience of reference.

COLLEGE DEPARTMENT REPORT 1903



1907 Miss Sophia F. Palmer, President, Rochester

1908 Miss Jane E. Hitchcock, Secretary, 265 Henry st. New York

1904 L. Bissell Sanford, 217 E. 27th st. New York

1905 Miss Annie Damer, 76 W. Huron st. Buffalo

1906 Miss Dorothea M. Macdonald, 90 Hewes st. Brooklyn.

This application [see Appendix, 26] and "Additional information" [see Appendix, 27] should be forwarded to the Director of the College and High School Departments, University of the State of New York, Albany N. Y. If returned with red ink memorandums the information called for is essential to registration.

Blanks for use in applying for the certificate of registered nurse (R. N.) and the nurse registration law with notes will be forwarded on application.

Action by the secretary. On the recommendation of the State Board of Nurse Examiners, the following letter was sent to all the superintendents of training schools for nurses in the United States.

Regents Office, Albany N. Y. September 1903

To the superintendent

DEAR SIR: In accord with the provisions of article 12, §206, public health law, inclosed, relative to the practice of nursing and on the recommendation of the State Board of Nurse Examiners, we are actively engaged in registering the training schools for nurses in the United States.

To avoid any misunderstanding, we are sending you a blank application for the registration of your training school for nurses. If you wish to secure the advantages of registration or to have your institution placed on the accredited list of the University of the State of New York, kindly fill out in detail and return at your earliest convenience the application for registration duly signed by the executive officer of the school with seal attached. Be sure that your latest announcement of requirements accompanies the application and indicate its date on line of the application. If your printed announcement does not give the programs or schedules of your year's work, kindly afford the same in manuscript.

Very truly yours

JAMES RUSSELL PARSONS JR

Summary of minutes of the meetings of State Board of Nurse Examiners Regents Office, Albany N. Y. Sep. 15, 1903

Present—Miss Damer, Miss Macdonald, Miss Palmer, Miss Hitchcock, Mr Sanford, Director Parsons and his assistant, H. L. Taylor.

The board organized by electing Miss Palmer as president and Miss Hitchcock as secretary. The board first considered and adopted a form of application for certificate as registered nurse.

Voted, That the test in practical nursing include both a practical demonstration and a written test involving the care of febrile cases, of patients before and after operation, of the mother and newborn babe in normal and abnormal obstetrical cases, of treatment of emergencies, and a knowledge of drugs with regard to toxicological symptoms and treatment after poisonous doses; that male nurses be examined on genito-urinary work as a substitute for obstetrical cases.

Voted, That the practical demonstration be conducted by a member of the board of examiners, who must recommend the applicant for admission to the written test; that both practical demonstration and written test be held on the dates and at the places prescribed for Regents examinations in the other professions; viz at New York, Albany, Syracuse and Buffalo, June 21, 1904, Jan. 24, 1905, June 20, 1905.

Voted, That, as the students in training schools prior to Ap. 27, 1903, are exempt from the full examination, it is not necessary to prescribe the conditions for certificate with full examination for some time to come, that requirements for such certificates be announced later.

Adjourned

JANE ELIZABETH HITCHCOCK

Secretary

265 Henry st. New York City, Jan. 2, 1904

Present—Miss Damer, Miss Hitchcock, Miss Macdonald, Miss Palmer.

Object of meeting. The board met to determine the scope of education, both preliminary and professional, to be required of training schools for nurses in order to entitle them to recommendation to the Regents of the University of the State of New York for registration as maintaining proper standards.

The curriculums of the training schools applying for registration show that the practice of sending out pupils to earn money for the hospital is obsolete among schools of the highest grade. Some restriction should be placed on hospitals still following

this custom that apply for the registration of their training schools.

The recommendations as amended and approved are given above.

Adjourned

JANE E. HITCHCOCK

Secretary

Library School

Credentials. In 1903 there were 449 passcards issued and 441 instructors passcards; 12 certificates, of which 10 were with honor; aggregating in all 902. For a discussion of these tests see the report of the New York State Library School.

[For further information *see* Appendix, 28]

TECHNICAL

Certified public accountant

C.P.A. examiners. In accordance with the law Leonard H. Conant C.P.A. was appointed a state examiner for the term ending July 31, 1903, and John R. Loomis C.P.A., John R. Sparrow C.P.A. and Ferdinand W. Lafrentz C.P.A. were appointed state examiners of certified public accountants, for the term ending July 31, 1904.

C.P.A. certificate. *Voted*, That the preliminary education requirement for admission to the C.P.A. examination be waived on the certificate of the examiners that an applicant possessed at the time the original C.P.A. act was passed all the requirements exacted by such law for the full C.P.A. certificate without examination.

Public accountant receipts and expenses. The receipts and expenditures in connection with the administration of the statute relating to certified public accountants from Ap. 1, 1902, to Ap. 1, 1903, are reported as follows in accordance with the provisions of the laws of 1896, chapter 312, § 2.

The receipts and expenditures in connection with the administration of the statute relating to certified public accountants

[laws of 1896, ch.312] from Ap. 1, 1902, to Ap. 1, 1903, were as follows:

27	\$25 fees	\$675
2	\$25 fees returned	50
	Net receipts	<u>\$625</u>

Payments

Printing	\$15 20
Part of cost to the University of conducting examinations and of postage, express, travel and other necessary office expenses	225 80
Paid to two examiners for postage, express, travel and other official expenses	384 ..
Total payments	<u>\$625 ..</u>

Certified public accountant examinations

These tests have been or are to be held under laws of 1896, chapter 312 as follows.

Dates

1903	1904
January 27-28	January 26-27
June 23-24	June 21-22

Places

New York, Albany, Syracuse, Buffalo. Each candidate is notified as to exact place.

Daily program

9.15 a. m.	1.15 p. m.
<i>Tuesday</i> Theory of accounts	Practical accounting
<i>Wednesday</i> Auditing accounts	Commercial law

Results of C.P.A. examinations. The results of these examinations [for further details see Appendix, 29] show from 1896 to 1903 steadily increasing numbers in examinations and a decreasing per cent of rejections.

Business education

I. O. Crissy, inspector of business education, submits the following report for the academic year 1903.

Private schools. The number of registered proprietary business schools at the end of the year was 31. Sworn reports have been received from these schools, from which it appears that the total value of the school property (including buildings, when owned by the school) was \$436,909.27. The value of the business school equipment was \$158,282.26. The number of teachers giving full time to the work was 285, of whom 135 were women. The number of students in attendance during the year was 13,546, of whom 6386 were women. The greatest number of days in actual session was 309, the least, 192. The greatest number of evening sessions was 252, the least, 69. Three schools did not hold evening sessions.

Comparison of the above statistics with those for 1902 indicates a steady and healthy growth of the private business schools. There has been during the year an increase in business school equipment of \$27,546.38, and in the total of business school property of \$130,867.38. There was an increase of 47 in the number of regular teachers and an increase of 2792 in the number of commercial students. Better still, the horizon of the private school is enlarging. Commercial geography and history of commerce were taught during the year by more than half of the registered schools, and more earnest attention was given to English.

Credentials. The University offers the following credentials based on Regents examinations in the undermentioned subjects:

State business credentials¹

Advanced bookkeeping	Business arithmetic
Commercial law	Business practice and office methods
Commercial geography	History of commerce
Business English	Business writing

¹The credentials are: state business certificate, state business diploma. For requirements in each case see Handbook 3.

State stenographers credentials:

Typewriting etc.

Business English

Stenography (100 word test passed at 90%)

Examinations for all credentials are held in January and June of each year. An examination in stenographers' subjects is held in March also. For exact dates *see* Handbook 3.

Seventy-seven business credentials were issued during the year to candidates from 15 different schools. [For names of recipients, alphabetically arranged by schools, *see* Appendix, 30]

Business examinations were taken in June by students from 10 of the registered proprietary schools and from 500² high schools and academies. This is an increase over 1902 of three private schools and 45 public high schools and academies. Of the high schools taking business examinations, 93 schools took five or more of the business subjects.²

High school courses. There are in this State 41 high schools and academies maintaining commercial courses of four years. There are two separate high schools of commerce in which all instruction, whether academic or technical, is given under one roof by teachers selected with a view to presenting each subject in the way that will make it most helpful to the commercial student. The Mount Vernon public commercial school, which was organized as a two year course, is now of high school grade, with a course of four years.

National and interstate meetings. Three important meetings in behalf of business education were held during the year: National Federation of Business Teachers, Milwaukee, December 1902; Eastern Commercial Teachers Association, New York, April 1903; department of business education, National Educational Association, Boston, July 1903. These meetings, each in its own

¹The credentials are: state stenographers certificate, state stenographers diploma. For requirements in each case *see* Handbook 3.

²Does not include academic (elementary) bookkeeping.

way, were believed to be the most helpful and satisfactory since the organization of the several bodies.

The meeting of the department of business education, National Educational Association, was of special interest as marking the culmination of two years' work of a select committee of nine appointed to prepare a monograph on business education, including the formulation of a general course of procedure and detailed courses of study for business education in high schools. Papers by specialists in their line of work were read and discussed, and one entire forenoon was devoted by the committee to hearing a free expression of views from a large and representative body of business teachers.¹

The monograph is printed as a separate bulletin.

Respectfully submitted

JAMES RUSSELL PARSONS JR *Director*

Regents Office, Albany N. Y. Mar. 4, 1904

APPENDIX

1 DEGREES CONFERRED BY THE UNIVERSITY

During the year the University has conferred the following degrees:

Bachelor of divinity. On the following (18) graduates of Union Theological Seminary:

Churchman, Arthur Brewer	Langdon, Stephen Herbert
Dunn, Alexander	McCallum, John Archibald
Field, Frank Edson	Mangano, Antonio
Fitch, Albert Parker	Swift, Fletcher Harper
Gleystien, William Henry	Taylor, Harry Leroy
Hoyt, John William, jr	Tinker, Wellington Hutchinson
Iverach, David	Travis, Thomas
Joseph, Oscar Loos	Van Aken, Elbert Wayland
Lang, David	Williams, Daniel Jenkins

¹See Address and Proceedings National Educational Association, 1903.

Bachelor of arts. On the following (13) graduates of Adelphi College (literary course) :

Auel, Pauline Marie	Gray, Temperance
Barber, Sara Matilda	Greene, Katherine Sargent
Bliss, Ida Lou	Hodges, Kate Louise
Burrows, Mary Hester	MacNary, Alice Beckwith
Coppins, Hazel Edna	Mitchell, Marguerite
Crane, William Albert	Turner, Kate Estelle
Frazer, George	

On the following (2) graduates of Keuka College:

Demcott, Orey Mason	Hawks, Blanche Loraine
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Bachelor of science. On the following graduate of Adelphi College:

Kennerly, Martha Mason

Bachelor of science in civil engineering. On the following (3) graduates of Clarkson School of Technology:

Batchelder, Benjamin Franklin	Sweet, George Gilbert
Beswick, James Everett	

On the following (7) graduates (2 in 1900 and 5 in 1903) of Mackenzie College, Sao Paulo, Brazil:

Campello, Hermillo Alvaro dos Reis	Orecchia, Alexander Maurice
Cococi, Alexander Mariano	Saraiva, Eliezer dos Sanctos
Eppinghaus, Mario Hardt	Shalders, Robert James
	Sodi, Luiz Carlos

Bachelor of science in electrical engineering. On the following (2) graduates of Clarkson School of Technology:

Delack, Burton Lewis	Lehr, Fred Michael
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Bachelor of science in mechanical engineering. On the following (1) graduate of Clarkson School of Technology:

Hodge, George Orvil

Bachelor of library science. On the following (3) graduates of New York State Library School:

Abbott, Etheldred	Whitmore, Frank Hayden
Hays, Alice Newman	

Doctor of medicine. On the following (8) graduates of the New York Medical College and Hospital for Women:

Brant, Cornelia Chase	Perry, Mabelle Jeanne
Folley, Etta	Potter, Mary Goddard
Higbie, Annie S.	Rosenfeld, Bertha Agnes
Hull, Annie Melissa	Wight, Lucy Osborne

Doctor of dental surgery. On the following (48) graduates of the New York College of Dentistry¹:

Beck, Louis Leonard	Mills, William Henry, jr
Beckel, Melville Jerome	Milsner, Henry
Bier, Sigmund	Mork, Waldo Hutchings
Brown, Edwin Stanton	Norcom, Clarence Martense
Edwards, Le Roy Sherman	Olsa, Victor
Faupel, Charles	Ortman, Max Jacob
Fiaschi, Piero	Oshalg, Isaac
Folkers, Oscar Herman	Ranché, Joseph Mota
Garner, William Francis, jr	Rathfelder, Gottlieb Chris
Gottfried, John Y.	Raymond, Edward Holman, jr
Grimm, Arthur	Schminke, Oscar
Johnson, Emil John	Schwartz, Joseph Mortimer
Levien, Edward Isaac	Schwarz, Frederick George
Levy, Joseph	Shnayerson, Edward
Lichtenwalner, Charles	Sloat, Julian Nicolas
Liebling, Samuel	Smith, Augustus Collier
Lief, Jacob Feodor	Sniffen, Charles Peck
Lowenstein, Julius	Stillpass, William
Luckie, Lorenzo Foster	Stoney, Arthur Crawford

¹These degrees are granted by the trustees and directors on the recommendation of the faculty with the consent of the Regents of the University.

Tepper, Barney	Weinzweig, Isidor Charles
Tillou, Charles Wesley, jr	Whaley, Edwin Grey
Tomlinson, Edward Sperry	White, Jacob
Unger, Nathan	Wolff, Simon Charles
Wakefield, Robert	Zeitlen, Henry Morton

On the following (10) graduates of the New York Dental School:

Andrews, Marjorie	Horwitz, Elizabeth Solomon
Conkling, Walter Augustus	Kuhl, Henry Andrew
Demarest, Harry Mott	McCulloch, Earl C.
Fox, Charles Lewis	McCulloch, Stephen
Himowich, Esther	Sabloff, Louis

2 LICENSES ISSUED BY THE UNIVERSITY ON EXAMINATION

During the year the University has issued licenses as a result of state examinations to: 633 physicians (562 old school, 41 homeopath, 30 eclectic); 176 dentists; 17 veterinarians; 11 certified public accountants.

Physicians licensed at examinations, Aug. 1, 1902-July 31, 1903

Group 1, New York schools; group 2, schools in other states; group 3, schools in foreign countries.

A means passed the examination with honor, i. e. at 90% or above in three fourths of the subjects.

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
NEW YORK SCHOOLS				
<i>Albany Medical College</i>				
Bolt, Fred E.....	1903	May	S	1
Boyd, Donald.....	1903	May	S	1
Branan, J. Howard.....	1903	June	S	1
Canfield, John E.....	1903	May	S	1
Champlin, Elwin.....	1902	Sep.	S	2
Chandler, Henry Milligan.....	1903	May	S	1
Clemans, Sylvester Cornell.....	1903	May	S	1
Clute, Russell.....	1903	May	S	1
Failed.....	1903	June	S	1
Cullen, Archie Irving.....	1903	June	S	1
Douglas, Archibald John.....	1903	May	S	1
Freutel, August John.....	1902	Jan.	S	1
Failed.....	1903	June	S	1
Failed.....	1897	June	S	4
Hoffman, Conrad Rowland.....	1903	May	S	1
Hoyt, R. Burdett.....	1903	May	S	1
Hull, Harry Fisk.....	1899	May	S	1
Johnson, Frank M.....	1898	Sep.	S	1
Keator, Frank.....	1903	May	S	1
A MacDonalld, Frederick John.....	1903	May	S	1
McGrane, Miles Ambrose.....	1903	May	S	1
Marsh, Charles Richard.....	1903	May	S	1
Maxon, Frank Clay, jr.....	1903	May	S	1
Merchant, John Crapo.....	1903	May	S	1
Mereness, Harry Erle, jr.....	1902	May	S	1
O'Connor, Thomas Stephen Augustine.....	1903	May	S	1
O'Meara, Mark M.....	1903	May	S	1
Racette, Joseph William.....	1893	Sep.	S	2
Selleck, Virgil Dural.....	1903	May	S	1
Shafer, Millard Francis.....	1903	May	S	1
Sibley, Edwin Forrest.....	1903	May	S	1
Smith, Frank Templeton.....	1903	May	S	1
Smith, George H.....	1903	May	S	1
Vander Veer, James Newell.....	1903	May	S	1
Van Hoesen, Isaac Ernest.....	1903	May	S	1
<i>Bellevue Hospital Medical College, New York</i>				
Hare, George Ray.....	1898	Sep.	S	1
<i>College of Physicians and Surgeons, New York</i>				
Abel, Samuel.....	1903	June	S	1
Andrews, Warren Beecher.....	1903	June	S	1
Bama, Lewis.....	1903	June	S	1
Bayles, Howard Alfred.....	1901	June	S	1
Beck, Erich Carl Adolph.....	1903	June	S	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>College of Physicians and Surgeons (continued)</i>				
Bentz, George Henry	1903	June	S	1
Failed	1902	Jan.	S	2
Birkhead, James	1899	Sep.	S	1
Blumgart, Leonard	1903	June	S	1
Bodenheimer, Milton	1903	June	S	1
Borden, John Harvey	1903	June	S	1
Brennglass, Joachim	1903	June	S	1
Brill, Abraham	1903	June	S	1
Brown, Alfred Jerome	1903	June	S	1
Brown, Frank Edwin	1903	June	S	1
Bugbee, Harry Greenwood	1903	June	S	1
Bullowa, Jesse Godfrey Moritz	1903	June	S	1
Burford, Mortimer Gilbert	1903	June	S	1
Busck, Gunni Julius	1902	Sep.	S	1
Chace, Arthur Freeborn	1903	June	S	1
Cochran, Guy Hunt	1900	Sep.	S	1
Cocks, Gerhard Hutchison	1903	June	S	1
Cohen, Frank	1903	June	S	1
Corrigan, Henry John Cole	1902	May	S	1
David, Frank Haines	1903	June	S	1
Dodd, Edward Lewis	1900	Jan.	S	1
Doolittle, Willard Foster	1902	Sep.	S	1
h Du Bois, Francis Elbert	1903	June	S	1
Dunseith, James Gracey	1901	Jan.	S	1
Durham, Roger	1903	June	S	1
Erdwurm, Frank	1903	June	S	1
Erskine, James Pendleton	1903	June	S	1
Fassett, Bryant Sloat	1903	June	S	1
Finch, Lew Henri	1903	June	S	1
Finn, Frederic Aloysius	1903	June	S	1
Failed	1901	Sep.	S	1
Franklin, Louis	1903	June	S	1
Fried, Gustav Adolph	1903	June	S	1
Goldfrank, Fred	1903	June	S	1
Gould, George Clifford	1903	June	S	1
Greif, Joseph	1903	June	S	1
Gross, Herman	1903	June	S	1
Failed	1902	June	S	1
Failed	1902	Sep.	S	1
Hahn, George Henry	1902	Jan.	S	1
Hall, Dupree Meriwether	1894	May	S	1
Hamilton, Samuel Warren	1903	June	S	1
Hammer, Julius	1902	Sep.	S	1
h Hanscom, Howard Chapin	1900	May	S	1
Harran, George Patrick	1903	June	S	1
Hart, George Graham	1902	Sep.	S	1
h Haynes, Royal Storrs	1903	June	S	1
Hazay, Max	1903	June	S	1
Herlitzka, Louis	1903	June	S	1
h Higgins, Spencer Littlefield	1903	June	S	1
Hirsch, Isaac Seth	1902	Sep.	S	1
Holdridge, Walter Henry	1903	June	S	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>College of Physicians and Surgeons (continued)</i>				
Horowitz, Israel	1903	June	S	1
h Humphreys, Frederick Brown	1903	June	S	1
Hyde, James Samuel	1902	Jan.	S	1
Irving, Peter	1903	June	S	1
Kent, James Manning	1903	June	S	1
h Kernan, John Devereux, jr.	1903	June	S	1
Kessel, Leo	1903	June	S	1
h Kingsbury, Isaac William	1903	June	S	1
Knipe, Joseph Bolton	1903	June	S	1
Knipe, William Hugh Wellington	1903	June	S	1
Le Comte, John Radway	1903	June	S	1
Failed	1902	June	S	2
Leiter, Horace Louis	1903	June	S	1
Lent, Malcolm Foster	1903	June	S	1
Lessem, William Wolfe	1903	June	S	1
Failed	1903	June	S	1
Failed	1902	June	S	1
McCastline, William Henry	1903	June	S	1
McCollom, William Ezra	1903	June	S	1
McFarland, William Landram	1901	June	S	2
Macnie, John Silliman	1896	June	S	1
Meeker, Harold Denman	1902	Sep.	S	1
Mitchell, Robert Jack	1901	Sep.	S	1
Mittendorf, William Elphinstone Keith	1898	Jan.	S	1
Morton, Elwood Stokes	1894	Sep.	S	1
Mosenthal, Herman Otto	1903	June	S	1
Murphy, Joseph Denis	1902	Sep.	S	1
Nelson, Nathan William	1903	June	S	1
Nicoll, Leonard Francis	1903	June	S	1
Owens, George Conrad	1903	June	S	1
Parkinson, James McDavid	1903	June	S	1
Paterson, Douglas Campbell	1903	June	S	1
Pelgram, George Oscar	1901	June	S	4
Pierson, Henry Morton	1903	June	S	1
Pollak, Alfred William	1902	Jan.	S	1
Quell, John Adam	1902	Jan.	S	1
Radin, Herman Theodore	1902	Sep.	S	1
Recknagel, William Edward	1903	June	S	1
Reinhardt, Emanuel	1901	Sep.	S	1
Riggs, Austen Fox	1902	Sep.	S	1
Robinson, Emanuel Marx	1903	June	S	1
Rodriguez, Joseph A. Diazol	1895	Jan.	S	1
Rokeach, Aaron	1903	June	S	1
Rosenbaum Morris	1903	June	S	1
Runyon, Laurance Phillip	1903	June	S	1
Saladino, Sebastian	1903	June	S	1
Scheina, Otto	1903	June	S	1
Schenck, Garrett Kouwenhoven Williamson	1901	Sep.	S	2
Schnepel, George Augustus	1903	June	S	1
Seckel, Walter	1902	Sep.	S	1
Silk, Morris	1902	Sep.	S	1
Sinnott, Joseph John	1903	June	S	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>College of Physicians and Surgeons (continued)</i>				
Smith, Davison Heermance.....	1902	Sep.	S	1
Smith, Leroy James.....	1903	June	S	1
Spanier, Louis.....	1903	June	S	1
Stern, Adolph.....	1903	June	S	1
Stork, Louis, jr.....	1903	June	S	1
Stryker, Edgar de Mott.....	1901	June	S	1
Taves, Archibald William.....	1903	June	S	1
Tunick, Isidore Solomon.....	1903	June	S	1
Twitchell, David Cushman.....	1903	June	S	1
Van Alstyne, William Becker.....	1902	Sep.	S	2
Van Wart, Franklin Brush.....	1902	Jan.	S	1
Vary, Harvey Judson.....	1903	June	S	1
von Huffman, Otto.....	1903	June	S	1
Walsh, James Joseph Sebastian.....	1901	Jan.	S	2
Weygandt, Fred George.....	1901	Sep.	S	4
Wheeler, Alfred W.....	1902	Sep.	S	1
Wickham, Joseph Nelson.....	1903	June	S	1
Young, Joseph Witham.....	1903	June	S	1
Zinsser, Hans.....	1903	June	S	1
<i>Cornell University Medical College, New York</i>				
Banker, Ernest E.....	1903	June	S	1
Boettiger, Carl.....	1903	June	S	1
Bugbee, Alice Gates.....	1903	June	S	1
Chapin, Charles Willard.....	1903	June	S	1
Coryell, Clarence Catlin.....	1903	June	S	1
Demarest, Ruth.....	1903	June	S	1
Dolan, Paul.....	1903	June	S	1
h Epstein, Sigmund.....	1903	June	S	1
h Faust, John Wesley.....	1903	June	S	1
Fincke, Harry Stark.....	1903	June	S	1
Fisher, Archie Max.....	1903	June	S	1
Gettinger, Joseph Herman.....	1903	June	S	1
Gould, Clark Sumner.....	1903	June	S	1
Hertz, Julius Jacob.....	1903	June	S	1
Hoerle, Horace Poinier.....	1903	June	S	1
Holt, Corliss Mason.....	1902	Sep.	S	1
Jachnowitz, Maurice Arthur.....	1903	June	S	1
Knauss, Charles William.....	1902	June	S	1
Kommel, Louis Moses.....	1903	June	S	1
Levy, Abraham Aaron.....	1903	June	S	1
Licht, Louis Frederick.....	1903	June	S	1
Lippman, Thomas Charles.....	1903	June	S	1
Ludwig, Robert Francis.....	1903	June	S	1
h Macleod, Murdoch Douglas.....	1903	June	S	1
Magill, William Henry.....	1903	June	S	1
h Moskowitz, Abraham.....	1903	June	S	1
Pfeiffer, William.....	1903	June	S	1
Quigley, James Knight.....	1903	June	S	1
Romansky, Benjamin.....	1903	June	S	1
Rosenberg, Herman.....	1903	June	S	1
Ruch, Valentine, jr.....	1903	June	S	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>Cornell University Medical College (continued)</i>				
Schwartzman, Samuel	1903	June	S	1
Searing, Benjamin Haff	1903	June	S	1
Sears, Keith	1903	June	S	1
Skernewitch, Abraham Marcus	1902	Sep.	S	1
Smith, Jane Beck	1901	Sep.	S	1
Stiefel, Isaac	1903	June	S	1
Strachstein, Abraham	1903	June	S	1
Streep, Isaac	1903	June	S	1
Sullivan, Michael Joseph	1900	Sep.	S	1
Thornton, Mary Frances Deraismes	1902	June	S	1
Vickers, Harry William	1903	June	S	1
Vogt, Walter Eugene	1903	June	S	1
von Sholly, Anna Irene	1902	Sep.	S	1
Vose, Royden Mandeville	1902	Sep.	S	1
a	1903	June	S	1
Weber, Edward William	1903	June	S	1
Wilson, Willets	1902	Sep.	S	2
Wright, Floyd Robins	1903	June	S	1
Zeiner, Eugene Jerome	1903	June	S	1
h Zucker, Morris	1903	June	S	1
<i>Eclectic Medical College, New York</i>				
Cohen, Louis	1903	May	E	1
Deutsch, Caesar	1903	May	E	1
b Dincin, Herman	1901	May	E	1
Fruchs, Samuel Littman	1902	Sep.	E	2
Failed	1902	June	E	3
Haas, Jacob	1903	June	E	1
Heffter, Antonia Johanna	1903	May	E	1
Hollander, Frederick	1903	May	E	1
h Ianovici, Solomon	1903	June	E	1
h Kallman, Joseph	1903	May	E	1
Mills, Adelaide	1903	May	E	1
Schwartz, Herman Benjamin	1903	May	E	1
Schwarz, Wladyslaw Josef Alfons	1902	Sep.	E	2
Skou, Max Henry	1903	May	E	1
Sturm, Maurice Arthur	1902	Jan.	E	1
h Tienken, Henrietta Siebert	1903	May	E	1
Turkel, Bertha Amelia	1903	May	E	1
<i>Long Island College Hospital, Brooklyn</i>				
Allen, Isaac Lathrop, jr.	1903	June	S	1
Atwater, Henry Harrison, jr.	1902	Sep.	S	1
Backus, Harold Simeon	1903	June	S	1
Bassin, John Nicholas	1903	May	S	1
Bellows, William Sanford	1900	June	S	1
Bonnell, Clarence Hornbeck	1902	May	S	1
Brown, Christopher William	1903	June	S	1
Failed	1903	June	S	1
Callahan, Dennis George	1903	Jan.	S	1

a Papers canceled for attempted fraud.

b Examined in May 1901, license held for completion of requirements.

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>Long Island College Hospital, Brooklyn (continued)</i>				
Crawford, John Fancher.....	1903	June	S	1
Dexter, Thurston Hopkins.....	1901	Sep.	S	1
Dooling, John Francis.....	1903	June	S	1
Doyle, Francis Benedict.....	1903	May	S	1
Doyle, Francis Joseph.....	1902	May	S	1
Ellis, Alfred Lauder.....	1902	Jan.	S	3
<i>h</i> Greeley, Horace.....	1903	May	S	1
Grossman, Max.....	1902	Jan.	S	1
Henning, Walter Hannibal.....	1903	June	S	1
Hirsch, Henry.....	1903	May	S	1
Hirsemann, Walter Gotthard.....	1903	June	S	1
Johnston, Frank Alford.....	1903	June	S	1
Kirby, George H.....	1899	June	S	1
Konther, Adolph Frederick.....	1902	Sep.	S	2
Lewis, Orville Nelson.....	1903	May	S	1
Long, John Hathaway.....	1903	June	S	1
Longmore, John Alva.....	1901	Sep.	S	1
Failed.....	1903	June	S	1
McIntyre, Henry Blodgett.....	1903	May	S	1
<i>h</i> MacNaughton, Donald Stuart.....	1903	May	S	1
Panoff, Charles Edward.....	1903	June	S	1
Prendergast, Francis Aloysius.....	1903	May	S	1
Raphaelson, Samuel Joshua.....	1903	June	S	1
Rauh, Maximilian Thomas.....	1897	Jan.	S	15
Rissmeier, Charles F.....	1903	June	S	1
Failed.....	1903	June	S	1
Schoenfeld, Morris.....	1903	June	S	1
Short, Samuel.....	1903	June	S	1
Taylor, Richard Augustus.....	1903	June	S	1
Telfair, John Hamilton.....	1901	May	S	1
<i>h</i> Tilney, Frederick.....	1903	May	S	1
Tong, George William.....	1903	May	S	1
Trumpp, Theodore Frederic.....	1903	June	S	1
Van Winkle, Le Roy Powell.....	1903	June	S	1
Walker, Charles James.....	1903	May	S	1
<i>h</i> Walling, William Fletcher.....	1903	May	S	1
<i>New York Homeopathic Medical College</i>				
<i>h</i> Benson, Reuel Allan.....	1903	June	H	1
Blair, Thomas Dalzell.....	1903	May	H	1
Failed.....	1901	Jan.	H	1
Chambers, Merritt Goodrich.....	1902	May	H	1
Cook, Edgar Baldwin.....	1903	June	H	1
Datesman, Clarence Wilson.....	1903	May	H	1
Ekings, Frank Parker.....	1903	May	H	1
Folwell, Judson Kincaid.....	1903	May	H	1
Fox, Robert Campbell.....	1903	June	H	1
Gates, James Moseley.....	1898	May	H	1
Hicks, Thomas Sheldon.....	1902	Sep.	H	1
Ingalls, Orlando Du Bois.....	1903	June	H	1
Johns, Miles Wendell.....	1903	June	H	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>New York Homeopathic Medical College (cont'd)</i>				
Kellogg Edwin Welles.....	1903	June	H	1
Leão, Francisco Garcia Pereira	1901	Jan.	H	1
Nichols, Walter Edmond	1903	June	H	1
h Perrin, William	1901	Jan.	H	1
Richardson, Arthur Hays	1902	Sep.	H	2
a h Scott, Sidney L.	1903	May	S	1
Tytler, James Edwin.....	1903	May	H	1
h Walsh, James	1903	May	H	1
Whitney George Winter.....	1903	June	H	1
Wilkes, Arthur Chalmers.....	1903	May	H	1
<i>New York Medical College and Hospital for Women</i>				
Brant, Cornelia C.....	1903	June	H	1
Klenk, Sophie Gottliebe	1901	Sep.	H	8
Novenski, Anna Mabel	1902	Jan.	H	1
Perry, Mabelle Jeanne.....	1903	June	H	1
Potter, Mary Goddard.....	1903	May	H	1
Rodenburg, Daisy Isabelle Whittemore	1902	June	H	1
Rosenfeld, Bertha Agnes.....	1903	May	H	1
Wight, Lucy Osborne.....	1903	June	H	1
<i>New York University, medical department</i>				
Failed.....	1889	Jan.	S	2
<i>Syracuse University, medical department</i>				
Atwater, David Hastings.....	1902	May	S	2
Brayton, Harry J.....	1903	June	S	1
Case, Howard Gregory.....	1903	June	S	1
Curtiss, Charles Erwin.....	1903	June	S	1
Davis, Walter William.....	1903	June	S	1
Foster, Pearl Mary.....	1903	June	S	1
Goodwin, Clinton Eddy.....	1903	June	S	1
Hall, William Pitt.....	1903	June	S	1
Hanor Welcome A.....	1903	June	S	1
Hart Lasher	1903	June	S	1
Haviland, Frank Ross	1903	June	S	1
Lenahan, Hugh Hagan.....	1903	June	S	1
Levy Jacob Joshua.....	1903	June	S	1
Neville, William Harry.....	1903	June	S	1
Nichols, Frederick Herbert.....	1903	June	S	1
Palmer, Joseph Coolidge.....	1903	June	S	1
Quackenbush, Camilla.....	1903	June	S	1
Richmond, Schuyler Parshall.....	1903	June	S	1
Seely, Jennie Gray.....	1903	June	S	1
Short, John Wesley.....	1903	June	S	1
Smith, Frederick William.....	1903	June	S	1
Steers, Cynthia.....	1903	June	S	1
Stephens, George Henry.....	1903	June	S	1
Stewart, Alexander McLaren.....	1903	June	S	1
Stone, Frederick Darwin.....	1903	June	S	1
Wood, Karl Dwight.....	1903	June	S	1

a Also holds diploma from University of Virginia 1901.

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>University and Bellevue Hosp. Med. Coll., New York</i>				
Auspitz, Martin.....	1903	June	S	1
Beaman, Allen Hoyt.....	1902	June	SS	1
Boyce, William Edgar.....	1903	June	S	1
Failed.....	1903	June	S	1
Caples, Byron H.....	1903	June	S	1
Failed.....	1903	June	S	1
Failed.....	1903	June	S	1
Donovan, John Joseph.....	1902	Sep.	S	1
Edmonds, Francis Charles.....	1903	June	SS	1
Elkins, Charles Edward.....	1903	June	S	1
Finley, Clyde Alexander.....	1903	June	SS	1
Frederickson Victor.....	1902	June	S	1
Gessner, Frank Edward.....	1903	June	S	1
Failed.....	1903	June	S	1
Golding, Joseph Edward.....	1903	June	S	1
Hatheway, Clarence Morris.....	1903	June	S	1
Heitlinger, John Anthony.....	1903	June	S	1
Herriman, Rudolph Francis.....	1903	June	S	1
Failed.....	1903	June	S	1
Hogan, Austin.....	1902	Jan.	S	1
Horowitz, Nathan Meyer.....	1903	June	S	1
Kahn, Moses.....	1903	June	S	1
Karmiohl, Louis.....	1903	June	S	1
Katzman, Adolph Samuel.....	1902	Jan.	S	1
Keller, Henry.....	1903	June	S	1
Kimball, Charles Denny.....	1902	June	S	1
Lightstone, Abraham.....	1902	Sep.	S	1
h McGovern, Louis Vincent.....	1902	Sep.	S	1
McGowan, John James.....	1903	June	S	1
h McKenna, Henry Joseph.....	1901	Jan.	S	1
Mandel, Arthur Rudolph.....	1902	June	S	1
Mendlowitz, Herman.....	1903	June	S	1
Mooney, Louis Morgan.....	1899	Sep.	S	2
Nagle, James Franklin.....	1903	June	S	1
Nelson, Frederick Lawrence.....	1903	June	S	1
Parce, Alexander Dwight.....	1903	June	S	1
Perlman Max.....	1903	June	S	1
Pick, Rudolph Emanuel.....	1903	June	S	1
Potter, James Harry.....	1900	Jan.	S	1
Reese, Harvey Lawrence.....	1903	June	S	1
h Richards, Ralph Taylor.....	1903	June	S	1
Scadron, Samuel Jerome.....	1903	June	S	1
Schrift, Joseph.....	1903	June	S	1
Failed.....	1903	June	S	1
Schwartz, Herman.....	1903	June	S	1
Stiles, James Walter, jr.....	1902	June	S	1
Stolworthy William Clegg.....	1903	June	S	1
Strack, Gustave.....	1903	June	S	1
Thorne, William Patterson.....	1902	Sep.	S	1
Tracy, Edward Murray.....	1903	June	S	1
Failed.....	1903	June	S	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>University and Bellevue Hosp. Med. Coll. (cont'd)</i>				
Wenger, Le Roy Joseph Charles	1903	June	S	1
Weston, Henry Reuben	1903	June	S	1
Wettersvik, Filip Johan	1903	June	S	1
Young, Warren Hastings	1903	June	S	1
<i>University of Buffalo, medical department</i>				
Abbott, Charles Edward	1903	Jan.	S	1
Failed	1899	Jan.	S	4
Beals, Clarence	1903	May	S	1
Failed	1893	May	S	2
Bishop, John L.	1903	May	S	1
Bond, Charles Lisle	1903	May	S	1
Bush, Elliot	1903	May	S	1
Cole, Frank Oliver	1903	June	S	1
Cummings, Carlos Emmons	1903	June	S	1
a.	1902	Sep.	S	1
Failed	1903	June	S	1
Drozski, Edward Henry	1903	June	S	1
Duchscherer, Clarence Christopher	1903	May	S	1
Eisenhart, James E.	1903	May	S	1
Fischer, George Louis	1903	May	S	1
Fraser, David Earl	1903	May	S	1
Gibson, May	1903	May	S	1
Gillick, Edward Eugene	1903	May	S	1
Graf, Herman F.	1896	May	S	2
Happell, James McAndrew	1903	May	S	1
Hardy, Glenn H.	1903	June	S	1
Harris, Albert Jabesh	1903	May	S	1
Horton, Eugene B.	1902	Jan.	S	1
Jones, Frank	1903	May	S	1
Kysor, Leon M.	1903	May	S	1
Mead, Eva V.	1900	Sep.	S	1
Munro, John Wesley	1903	May	S	1
Palmer, Albert William	1903	May	S	1
Parmenter, Frederick James	1903	May	S	1
Purcell, Fred Cole	1903	May	S	1
Putnam, Edwin David	1903	May	S	1
h Regester, Hyatt	1903	May	S	1
Riesenfeld, Edwin Albert	1903	May	S	1
Roberts, Carroll Julian	1903	May	S	1
Roberts, Hibbert Rice	1903	June	S	1
Sackrider, John Raymond	1902	Sep.	S	2
Shreve, Owen Malcom	1892	Sep.	S	1
h Simpson, Burton Thorne	1903	June	S	1
Storck, Edward Hugo	1903	May	S	1
h Suess, Chris Lester	1903	May	S	1
Swerdfeger, George Calvin	1903	May	S	1
Veeder, Willard Hall	1903	May	S	1
h Villiaume, L. Edward	1903	May	S	1
Washburn, John Lewis	1903	May	S	1
Weed, Harry Milton	1903	May	S	1

a Papers canceled for attempted fraud.

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
SCHOOLS IN OTHER STATES				
California				
<i>University of California, med. dept., San Francisco</i>				
Dinkelspiel, Edgar	1899	Sep.	S	1
Colorado				
<i>Gross Medical College, Denver</i>				
Friesner, Isidore	1901	Sep.	S	1
Connecticut				
<i>Yale University, medical department, New Haven</i>				
Costello, Patrick Vincent	1901	May	S	1
Edwards, Gaston Holcombe	1902	May	S	1
Foster, Dean	1899	Sep.	S	1
Maroney, William John	1900	Jan.	S	1
Moore, John David	1902	May	S	1
District of Columbia				
<i>Columbian University, Washington</i>				
Costello, Michael E	1902	May	S	1
<i>Georgetown University, Washington</i>				
Kingston, Augustine Thomas Vincent	1902	May	S	1
Walker, William Henry	1902	Jan.	S	1
<i>Howard University, Washington</i>				
a	1903	June	S	1
Georgia				
<i>Atlanta Medical College</i>				
Failed	1894	May	S	1
Morgan, William Alexander	1897	Sep.	S	1
<i>Georgia College of Eclectic Med. and Surg., Atlanta</i>				
Durham, Arta Bowen	1888	Jan.	E	3
<i>University of Georgia, medical department, Augusta</i>				
Shapiro, Isaiah Raphael	1901	Jan.	S	1
Illinois				
<i>American Medical Missionary College, Chicago</i>				
Patterson, Louise	1899	May	S	2
<i>Chicago Homeopathic Medical College</i>				
Kendrick, Chalmers Nash	1898	May	H	1
b Sandall, Laurel B.	1895	June	S	1

a Papers canceled for attempted fraud.

b Also holds diploma from Detroit College of Medicine, Michigan 1902.

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>College of Physicians and Surgeons, Chicago</i> (medical department, Illinois University)				
Osness, Abraham M.....	1894	May	S	3
<i>Hahnemann Medical College and Hospital of Chicago</i>				
Failed.....	1879	Sep.	H	1
<i>Illinois Medical College, Chicago</i>				
Failed.....	1890	June	S	15
<i>Rush Medical College, Chicago</i>				
Barnesby, Percy Norman.....	1898	Jan.	S	3
Goldberg, Joseph Benjamin.....	1902	Sep.	S	1
Jameson, Curtiss Norton.....	1902	June	S	1
Indiana				
<i>Fort Wayne College of Medicine</i>				
Failed.....	1882	Jan.	S	1
Iowa				
<i>Drake University, medical department, Des Moines</i>				
Plummer, Harry Ephraim.....	1901	June	S	1
Kentucky				
<i>Louisville Medical College</i>				
Anderson, John Cameron.....	1897	May	S	1
Jenkins, Amon Rathbon.....	1881	Jan.	S	1
<i>University of Louisville, medical department</i>				
Halsey, Bruce Frary.....	1901	Jan.	S	3
Maine				
<i>Bowdoin College, medical department, Brunswick</i>				
Failed.....	1892	June	S	1
Maryland				
<i>Baltimore Medical College</i>				
Allen, Wilmot B.....	1898	Jan.	S	1
Carr, Emory Ward.....	1902	Jan.	S	1
Gallagher, James L.....	1902	June	S	1
Keating, John Joseph.....	1898	June	S	3
Knight, Herbert Wilcox.....	1903	June	S	1
Nisonoff, Louis L.....	1901	May	S	4
Osgood, Walter Wordsworth.....	1902	Jan.	S	3
Smith, Houghton Currier.....	1903	June	S	1
Thomas, Emery Jordan.....	1902	Jan.	S	1
<i>Baltimore University School of Medicine</i>				
Blitzer, Nathaniel.....	1902	Sep.	S	1
Levine, Louis Joseph.....	1898	June	S	11
Failed.....	1900	June	S	1
Rogers, Charles T. Graham.....	1899	Sep.	S	2

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>College of Physicians and Surgeons, Baltimore</i>				
Collier, George Kirby	1900	Jan.	S	1
Dolan, Andrew John	1902	May	S	1
h Sprague, Edward Wharton	1903	June	S	1
<i>Johns Hopkins University, medical dep't, Baltimore</i>				
Berry, John McWilliams	1901	Sep.	S	1
Glenny, W. Harry	1902	Jan.	S	1
Karsted, Alfred	1902	Jan.	S	1
h Long, Henry D.	1903	June	S	1
h Rainforth, Selden Irwin	1903	June	S	1
Warren, George William	1901	May	S	1
<i>Maryland Medical College, Baltimore</i>				
Mandelbaum, Abraham	1901	Sep.	S	1
Schneidenbach, Arthur Jackson Melchior	1901	May	S	7
<i>School of Med. of the Univ. of Maryland, Baltimore</i>				
Lakin, Harry Allen	1903	June	S	1
Rosenthal, Morris	1902	Jan.	S	1
Villamil, Felix	1903	June	S	1
Massachusetts				
<i>Boston University, school of medicine</i>				
Abbott, Susan Edgur	1902	Sep.	H	1
Barnard, Esther Subia	1900	Sep.	H	1
Purmort, Jennie Grace	1901	Sep.	H	1
<i>College of Physicians and Surgeons, Boston</i>				
Davis, Arthur Fletcher	1900	Sep.	S	5
Failed	1899	Sep.	S	1
<i>Harvard University, medical school, Boston</i>				
Bedell, Charles E.	1900	June	S	1
Benner, Richard Stanwood	1903	June	S	1
Bryant, William Sohier	1888	May	S	1
h Cornwell, Herbert Cerdá de Vilarrestan	1900	Sep.	S	1
h Feldstein, Samuel	1902	Sep.	S	1
h Griffiths, Albert Farnsworth	1901	Sep.	S	1
Hubbard, Rufus P	1883	June	S	1
Moxom, Philip Wilfrid Travis	1901	Sep.	S	1
Failed	1902	May	S	2
Warren, Hobart Endicott	1894	Jan.	S	1
<i>Tufts College, medical school, Boston</i>				
Gehris, Oscar Thompson	1898	Jan.	S	2
Michigan				
<i>Detroit College of Medicine</i>				
Power, William Thomas	1902	Sep.	S	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>University of Michigan, Ann Arbor</i>				
Allen, Florence Elizabeth	1899	May	S	1
Armstrong, William Coleman	1893	May	S	1
Beck, Edwin G. H.	1903	June	H	1
Douglas, Sumner Egbert	1903	June	S	1
Findlay, Jessica W.	1889	Sep.	S	1
Gleason, John E.	1908	June	S	1
Inch, George Franklin	1895	June	S	1
Neal, Thomas Alvin	1901	June	S	2
Failed	1870	May	S	2
Smith, De Verne Churton	1903	June	S	1
Wallace, George Barclay	1897	Jan.	S	1
Minnesota				
<i>Coll. of Homeo. Med. and Surg., Univ. of Minnesota, Minneapolis</i>				
h Mitchell, Roy Ernest	1901	Jan.	H	1
<i>College of Med. and Surg., Univ. of Minnesota, Minneapolis</i>				
Bebb, Rose Anne	1897	Sep.	S	1
Missouri				
<i>American Medical College, St Louis</i>				
Gibson, Helen Frances	1901	May	E	1
<i>St Louis Med. Coll., med. dep't of Washington Univ. St Louis</i>				
De Lisser, Glenwood Medcalfe	1897	Jan.	S	1
<i>University of Missouri, medical dep't, St Louis</i>				
Munday, Bert	1899	June	S	1
Ohio				
<i>Cleveland Homeopathic Medical College</i>				
Warren, Richard Cornell	1903	May	H	1
Watson, Frederick Cushman	1896	Sep.	H	1
<i>Medical College of Ohio (University of Cincinnati)</i>				
Nye, Albert F.	1897	Jan.	S	2
Sturm, Max	1889	May	S	1
Oregon				
<i>Willamette University, Portland</i>				
Davis, Sherman T.	1885	June	E	2
Pennsylvania				
<i>Hahnemann Medical Coll. and Hospital, Philadelphia</i>				
Hall, Edwin Perry	1903	June	H	1
Snodgrass, John Elmer	1902	June	H	1
Thomson, Thomas Leonard	1901	June	H	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>Jefferson Medical College, Philadelphia</i>				
Friedman, Aaron	1902	Sep.	S	1
Goddard, Francis Wayland	1901	June	S	1
Held, Isidore William	1902	Sep.	S	1
Langstrat, Francis Ward, jr.	1901	Jan.	S	1
Lisle, Justin D.	1882	Jan.	S	1
Richards, John David	1897	Jan.	S	1
Wagner, John J.	1897	Jan.	S	2
<i>Medico-chirurgical College of Philadelphia</i>				
Birchard, Fred Sherman	1903	June	S	1
Loutflan, John	1902	Sep.	S	1
<i>University of Pennsylvania, Philadelphia</i>				
Alburger, Henry Rihl	1902	Sep.	S	1
Allwein, John Howard	1892	May	S	2
Andrus, Walter Haskell	1903	June	S	1
Beir, Ily Rosenberg	1902	Sep.	S	1
Bontecou, Howell Sylvester	1902	Sep.	S	1
Clark, William Laurence	1903	June	S	1
Cullinan, Henry Molyneux	1903	June	S	1
Fish, Harry Spaulding	1903	June	S	1
Green, Herlwyn Ruggles	1903	June	S	1
Howard, Tasker	1903	June	S	1
James, Harry Murray	1898	Sep.	S	1
Karsner, Howard Thomas	1903	June	S	1
Kearney, James Anthony	1903	June	S	1
Lindsay, George Gunn	1902	May	S	1
Lippincott, Walter Crispin	1903	June	S	1
Lummis, Marshall Flower	1901	June	S	1
McCaskey, Donald Gilbert	1903	June	S	1
McClary Samuel, 3d.	1903	June	S	1
McKelway, John Irvine	1897	Sep.	S	1
Mackinney, William Humphrey	1903	June	S	1
Mead, Ralph Klickner	1903	June	S	1
Nielsen, Louis Bernhard	1903	June	S	1
Pursel, William Dana	1901	Jan.	S	1
Riggin, Lev Lore	1900	Sep.	S	1
Ross, Napoleon Bertrand	1903	June	S	1
Saybolt, William Frederic	1902	Jan.	S	1
Shoemaker, Harlan	1902	June	S	1
Skilern, Penn-Gaskell, jr.	1903	June	S	1
Smith, Lloyd Llewellyn	1901	Jan.	S	1
Stimson, George William	1903	June	S	1
Tarbox, Harry Russell	1903	June	S	1
Thomas, Benjamin Abraham	1903	June	S	1
Thompson, Wellington Andrew	1903	June	S	1
Van Dyke, Joseph Smith, jr.	1903	June	S	1
Witmer, Albert Ferree	1893	Jan.	S	1
Woods, Arthur Roy	1903	June	S	1
Young, James Harrington	1901	May	S	1

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>Western Pennsylvania Medical College, Pittsburg</i>				
Foster, Eli Norman.....	1903	June	S	1
Sapirstein, Nahum Leon.....	1892	May	S	2
<i>Woman's Med. Coll. of Pennsylvania, Philadelphia</i>				
Bancroft, Mabel Harvey Falk.....	1903	June	S	1
Conant, Mary Chilton.....	1899	June	S	1
Hintze, Anne Augusta.....	1903	June	S	1
Potter, Ellen Culver.....	1903	June	S	1
Spencer, Elizabeth C.....	1903	June	S	1
Storm, Katherine Louise.....	1898	June	S	1
Tennessee				
<i>University of the South, Sewanee</i>				
Buckle, Louis.....	1901	Jan.	S	2
Hoenberg, Bernard.....	1901	Sep.	S	2
<i>Vanderbilt University, Nashville</i>				
Jones, Anzi.....	1900	Sep.	S	1
Vermont				
<i>University of Vermont, Burlington</i>				
Avery, John Waite.....	1897	June	S	1
Crumb, Jaynes Mott.....	1902	Jan.	S	2
Finney, Frank Floyd.....	1902	Jan.	S	1
Failed.....	1898	Jan.	S	1
Preston, Frank.....	1903	June	S	1
Stafford, Jonathan Mather.....	1896	May	S	1
Virginia				
<i>University of Virginia, Charlottesville</i>				
Beckwith, Julian Ruffin.....	1899	Jan.	S	1
McGavock, Edward Pointer.....	1893	Jan.	S	1
a.....	1899	Jan.	S	1
Spiller, William H.....	1894	Sep.	S	1
SCHOOLS IN FOREIGN COUNTRIES				
Austria-Hungary				
<i>University of Vienna, Austria</i>				
Feuerstein, Elias Selig.....	1887	Jan.	S	1
Husserl, Siegfried.....	1900	Sep.	S	1
Canada				
<i>McGill University, Montreal</i>				
Baillie, Samuel Alexander.....	1902	Jan.	S	1
Gardner, Robert Lorne.....	1901	Jan.	S	1
Kissane, John William.....	1903	June	S	1
Maby, William John.....	1903	June	S	1
O'Neill, James Michael.....	1903	June	S	1

a Requirements not yet fully met.

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>Ontario Medical College for Women, Toronto</i>				
Connor, Emma	1902 ^a	Jan.	S	1
<i>Queen's University, Kingston</i>				
Allison, David Membery.....	1900	Jan.	S	1
Bell, Frederick McKelvey.....	1903	June	S	1
Gage, James Edgar.....	1898	Sep.	S	1
Haskin, Byron	1903	May	S	1
Pritchard, John Albert.....	1903	June	S	1
<i>Trinity Medical College, Toronto</i>				
Cook, Albert Herman.....	1903	June	S	1
Service, Herbert Ezra.....	1902	Jan.	S	1
<i>Trinity University, Toronto</i>				
Farewell, Norman Eugene.....	1897	Jan.	S	1
<i>University of Toronto</i>				
Frederick, Ernest Victor.....	1903	June	S	1
Graef, Charles V.....	1896	Jan.	S	1
a	1903	June	S	1
Pirie, George Robinson.....	1901	May	S	1
Smith, Everett Gibbs.....	1892	June	S	1
Vivian, Reginald Percy.....	1899	June	H	1
<i>England</i>				
<i>Royal College of Surgeons</i>				
<i>Licensed Royal College Physicians, London</i>				
MacLeod, James Alexander.....	1903 1902	} May	S	1
<i>France</i>				
<i>Academy of Paris</i>				
Goldman, Malca	1899	May	S	2
<i>Germany</i>				
<i>University of Berlin</i>				
Ewh, Eugene	1891	Sep.	S	1
Gutmann, Hugo	1896	Jan.	S	1
Helmann, Max	1896	Sep.	S	1
Wels, Arthur II.....	1901	June	S	1
<i>University of Giessen</i>				
Heckmann, Jacob.....	1896	Sep.	S	1
<i>University of Kiel, Prussia</i>				
Klein, Hugo Oswald.....	1897	Jan.	S	1
<i>University of Munich</i>				
Failed	1903	June	S	1
Failed	1892	June	S	1
Ruppert, Franz Caspar.....	1899	June	S	4

^a Requirements not yet fully met.

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
Italy				
<i>University of Bologna</i>				
Righi, Simplicio	1897	Sep.	E	a8
<i>University of Genoa</i>				
Figallo, Agostino	1898	Jan.	S	2
<i>University of Naples</i>				
Atonna, Carmine	1895	Jan.	E	3
Albano, Giuseppe	1902	May	S	1
Capobianco, Luigi	1897	Sep.	E	b10
Cavallaro, Antonino	1896	Sep.	S	1
Failed	1893	May	E	1
Colacurcio, Nicola	1898	Sep.	S	1
D'Ambrosio, Luigi	1876	June	E	c8
D'Angelo, Raffaele	1894	June	E	4
Failed	1897	Jan.	E	1
Failed	1888	May	S	1
Failed	1903	June	S	1
DeStefano, Oreste	1903	June	S	1
Donati, Giuseppe	1892	Jan.	S	3
Doyno, Gennaro	1899	June	S	7
Fabiani, Vincenzo Giuseppe	1889	Jan.	S	1
Failed	1895	May	S	1
Failed	1891	Jan.	S	1
Failed	1899	June	S	2
Mannarino, Vincenzo	1895	Jan.	E	1
Mastroberti, Gaetano	1900	Sep.	E	3
Failed	1900	June	S	1
Millite, Germano	1898	May	E	2
Failed	1878	May	E	1
Sabatino, Achille	1900	Jan.	E	d4
Sammarelli, Gaetano Francesco	1898	Jan.	E	d4
Sparano, Gennaro	1897	May	E	2
Testa, Gustavo	1902	June	S	3
Failed	1900	Sep.	S	1
Tppolito, Gennaro	1898	May	S	1
Viggiani, Michele	1886	May	S	3
Zito, Luigi	1900	June	E	e4
<i>University of Palermo</i>				
Barabini, Gioachino	1901	June	S	3
Failed	1895	June	S	2
Busardo, Calcedonia	1898	Jan.	S	4
Cassata, Giuseppe	1894	Sep.	S	1
Purpura, Giuseppe A.	1891	June	S	3
Failed	1900	Jan.	S	1
Viola, Emanuele	1901	June	S	4

a Seven examinations before state board. b First eight examinations before state board. c First examination before state board. d First two examinations before state board. e First three examinations before state board.

Physicians licensed at examinations etc. (continued)

NAME OF CANDIDATE	Date of graduation	Date of examination	Board	No. of trials
<i>University of Turin</i>				
Collora, Nicolo	1898	Jan.	S	2
Tedesco, Guglielmo	1899	Sep.	S	1
Roumania				
<i>University of Bucharest</i>				
Steinbach, Olga Kopystynska	1901	June	S	1
Steinbach, Simon	1901	June	S	1
Steiner, Saul	1902	Jan.	S	1
Failed	1899	June	S	3
<i>University of Yassy</i>				
Granet, Adolf	1897	Jan.	S	1
Meikdel, Aron A.	1896	June	S	1
Russia				
<i>Imperial University of Jurief (Dorpat)</i>				
Friedman, Gedde Abraham	1895	Jan.	S	2
Landa, Michael Saul G.	1900	Jan.	S	3
<i>Imperial University of Kharkov</i>				
Lehman, Isaias	1900	June	S	1
Radin, Maurice L.	1897	May	S	1
Rosenon, Leon	1887	Jan.	S	1
<i>University of Warsaw</i>				
Elsenstadt, Abram Zundel.	1893	Jan.	S	1
Scotland				
<i>Royal Coll. of Physicians and Surgeons, Edinburgh</i>				
<i>Faculty of Physicians and Surgeons, Glasgow</i>				
Flanagan, John	(1900) (1900)	Sep.	S	1

Candidates in partial examinations Aug. 1, 1902-July 31, 1903

Group 1, New York schools; group 2, schools in other states; group 3, schools in foreign countries

NAME OF CANDIDATE	Date of examination	Board	No. of trials
NEW YORK SCHOOLS			
<i>Albany Medical College</i>			
Basch, Samuel H. B.	June	S	1
Blackfan, Kenneth Daniel	May	S	1
Cotter, John Isaac	May	S	1
Cowell, Walter Allen	June	S	1
Croissant, Charles Augustus	May	H	1
Dockstader Theodore David	June	S	1
Donahoe, Patrick John	June	S	1
Flynn, Thomas Joseph, jr.	May	S	1
Garlock, Perlia Elijah	June	S	1
Hacker, Charles William Louis	June	S	1
Hemstreet, Chester Arthur	May	S	1
Hull, Thurman Alson	May	S	1
Hurley, Frank James	May	S	1
Kline, Arthur Charles	May	S	1
Larson, Oscar F.	May	S	1
Failed	Jan.	S	1
Failed	Jan.	S	9
Rowe, Henry S. jr.	May	S	1
Rulison, Harry	May	S	1
Schuyler, A. Hamilton	May	S	1
Singleton, Benjamin J.	Sep.	S	1
Stapleton, Edward Augustine	Jan.	S	1
Sweet, Charles Clark	May	S	1
Thomas, Arthur Wesley	Jan.	S	1
Waterbury, Roscoe Conkling	May	S	1
Wilson, Edwin Barnes	May	S	1
Wilson, Guy Vail	May	S	1
<i>College of Physicians and Surgeons, New York</i>			
Assenheimer, Edward Minturn	Jan.	S	2
Barker, Perceva Martin	June	S	1
Barrett, Frederick James	June	S	1
Bartow, Lawrence Whittemore	June	S	1
Bennett, John Albert	June	S	1
Failed	June	S	1
Blauner, Samuel	Sep.	S	1
Block, Mark	June	S	1
Bonyge, Henry Arthur	June	S	1
Braun, Jacob	June	S	1
Breed, Robert Huntington	Sep.	S	1
Brown, Robert Merida	June	S	1
Burrows, Waters Field	Sep.	S	1
Byrd Francis Otway	Sep.	S	1
Chamberlain, Ams Reading	June	S	1
John, Alfred Einstein	May	S	1
Commiskey, Leo John Joseph	Sep.	S	1
Cramp, Walter Concomore	Sep.	S	1

Candidates in partial examinations etc. (*continued*)

NAME OF CANDIDATE	Date of examination	Board	No. of trials
<i>College of Physicians and Surgeons (cont'd)</i>			
De Klyn, Charles Campbell.....	June	S	1
Emory, George Bache.....	June	S	1
Fassett, Edwin Charles.....	Sep.	S	1
Fichter, Louis.....	Sep.	S	1
Finkelstein, Harry.....	Sep.	S	1
Friedman, Harry Jacob.....	June	S	1
Gellert, Samuel.....	Sep.	S	1
Gerster, John Carl Arpad.....	June	S	1
Goldstone, Karl Harold.....	Sep.	S	1
Graham, Henry Flack.....	May	S	1
Harbeck, Charles John.....	June	S	1
Hardenberg, Daniel Sayer, jr.....	Sep.	S	1
Harrigan, Anthony Hart.....	June	S	1
Harris, Louis Israel.....	June	S	1
Hellman, Alfred M.....	June	S	1
Holthausen, William Frederick.....	June	S	2
Horowitz, Philip.....	Sep.	S	1
Hutchinson, Robert Hamilton, jr.....	June	S	1
Hyman, Abraham.....	June	S	1
Jacobs, Louis.....	Sep.	S	1
Jarcho, Julius.....	Sep.	S	1
Kaliski, David John.....	June	S	1
Keller, Sidney Clarence.....	June	S	1
Knapp, Clinton Beecham.....	May	S	1
Levy, Julius.....	Sep.	S	1
Lewis, Murney Edward.....	June	S	1
Lohman, William Henry.....	Sep.	S	1
Mabey, J. Corwin.....	June	S	1
Failed.....	Sep.	S	1
Mount, Walter Barclay.....	June	S	1
O'Connor, John Charles.....	Sep.	S	1
Schlivek, Kaufman.....	Sep.	S	1
Schulman, Maximilian.....	June	S	1
Failed.....	June	S	1
Stevens, Carol Tefft.....	Sep.	S	1
Stevens, Harry Harrington.....	June	S	1
Valentine, Julius John.....	June	S	1
Vandenberg, Joseph.....	Sep.	S	1
Ward, Wilbur.....	Sep.	S	1
Waterman, William Whitney.....	Sep.	S	1
White, Davenport.....	June	S	1
Wilson, Frederic Hart.....	June	S	1
Wise, Fred.....	Sep.	S	1
Woodruff, Isaac Ogden, jr.....	Sep.	S	1
Woolley, James Stanley.....	June	S	1
Wright, Harold Walgrave.....	June	S	1
<i>Cornell University Medical College, New York</i>			
Aranow, Harry.....	Sep.	S	1
Armstrong, Arthur Soper.....	Sep.	S	1
Becker, Damas Brough.....	June	S	1
Bernfeld, Samuel Joachim.....	Sep.	S	1

Candidates in partial examinations etc. (*continued*)

NAME OF CANDIDATE	Date of examination	Board	No. of trials
<i>Cornell University Medical College (cont'd)</i>			
Bozenhardt, William Frederick.....	June	S	1
Broder Charles.....	June	S	1
Chapman, Milton.....	June	S	1
Clark, Zella M.....	June	S	1
Cudmore, John Homer.....	June	S	1
Eno, Harry.....	Sep.	S	1
Fancher, Eliza A.....	June	S	1
Farrell, Benjamin Peater.....	June	S	1
Freedman, Louis.....	June	S	1
Genung, Lewell T.....	June	S	1
Groesbeck, Harvey Paterson.....	June	S	1
Harris, George Francis.....	Sep.	S	1
Heim, John Alfred.....	June	S	1
Hills, Rollin.....	June	S	1
Hinz, William.....	June	S	1
Hubbell, Hiram Gaylord.....	June	S	1
Hutton, Robert LeRoy.....	June	S	1
Isaacs, Harry Ezekiel.....	June	S	1
Kerr, William Murray.....	June	S	1
Klein, Morris James.....	June	S	1
London, Julius.....	June	S	1
MacGregor, Herbert Paterson.....	June	S	1
MacKellar, James Malcolm.....	June	S	1
Maybaum, Jacob.....	June	S	1
Murset, Charles William.....	June	S	1
Newton, George Albert.....	June	S	1
Patterson, Robert R.....	June	S	1
Phillips, Earle W.....	June	S	1
Richards, John Harold.....	June	S	1
Robinson, Ralph.....	June	S	1
Smith, John Van Wagner.....	June	S	1
Smithe, Percy Allis Winans.....	June	S	1
Stanley, Grant.....	Sep.	S	1
Stein, Herbert Edward.....	June	S	1
Steiner, Sydney.....	Sep.	S	1
Stigner, Per.....	June	S	1
Wach, Milton Goodman.....	June	S	1
Welghart, Joseph B.....	June	S	1
Wescott, Adeline May.....	June	S	1
Wilcox, Roscoe Squires.....	June	S	1
Worts, Elizabeth Mannister.....	June	S	1
Zimmer, Wilson Briggs.....	June	S	1
<i>Eclectic Medical College of the City of New York</i>			
Fallick, Morris.....	May	E	1
Kesnet, Frances.....	June	E	1
Lewis, Sylvia.....	May	E	1
Mendelson, Ida.....	May	E	1
Noack, Charles Louis Herman Frederick.....	May	E	1
Selinger, Charles H. S.....	May	E	1
Villone, Nicholas.....	May	E	1

Candidates in partial examinations etc. (continued)

NAME OF CANDIDATE	Date of examination	Board	No. of trials
<i>Long Island College Hospital, Brooklyn</i>			
Albers, Frederick Martin.....	May	S	1
Bast, Oscar August.....	May	S	1
Beck, Albert William.....	May	S	1
Bishop, David Treadwell.....	June	S	1
Brockway, Robert Ormiston.....	June	S	1
Cifaldi, Alexis.....	June	S	1
Doran, William Thomas.....	May	S	1
Elysowitz, Salomon.....	June	S	1
Frank, Samuel.....	Sep.	S	1
Gershenson, Edward Harry.....	June	S	1
Goffen, Abraham Marks.....	May	S	1
Goldsmith, Joseph Washington.....	May	S	1
Goodman, Henry.....	June	S	1
Hoage, David Ivison.....	May	S	1
Hover, Frank William.....	May	S	1
Kaiser, Jacob.....	June	S	8
Kasper, Gerard.....	June	S	1
Lewis, George Rae.....	June	S	1
Mootnick, Morris William.....	June	S	1
Rogers, William Henry, jr.....	May	S	1
Thomson, Alec Nicol.....	May	S	1
Van Deinse, William Frederick, jr.....	Sep.	S	1
Vosseler, Theodore Luther.....	June	S	1
Wolfs, Jean François.....	May	S	1
<i>New York Homeopathic Medical College</i>			
Cottrell, Willard.....	May	H	1
Deyo, Charles Knight.....	May	H	1
Douinick, George Carleton.....	Sep.	H	1
Easton, Elwood Merritt.....	May	H	1
Gaines, John Strother, jr.....	Sep.	H	1
Gannett, George John.....	June	H	1
Pettet, Edwin James de Leu.....	Sep.	H	1
Sanders, Harold Armstrong.....	May	H	1
Sayre, Harry Clinton.....	May	H	1
Strachan, David Clark.....	June	H	1
Taylor, George Herbert.....	May	H	1
<i>New York Medical College and Hospital for Women</i>			
Folley, Etta.....	June	H	1
Higbie, Annie S.....	Sep.	H	1
Holm, Gudrun.....	June	H	1
Van deMark, Gertrude.....	May	H	1
Willensky, Eva.....	June	H	1
<i>Syracuse University, medical department</i>			
Burrett, Claude Adelbert.....	June	H	1
Bush, Archer Corbin.....	June	S	1
Canna, Richard Robert.....	June	S	1
Carballeira y Canellas, José.....	June	S	1
Cary, William Hollenback.....	June	S	1
Dings, Elda Martin.....	June	S	1
Finch, Sarah Elizabeth.....	Sep.	S	1

Candidates in partial examinations etc. (*continued*)

NAME OF CANDIDATE	Date of examination	Board	No. of trials
<i>Syracuse University, medical department (cont'd)</i>			
Failed	June	S	1
Harris, Roland Charles.....	June	SS	1
Heiman, Jesse Strauss.....	June	SS	1
Helmer, Ross Dorr.....	June	SS	1
Hurley, Albert Richmond.....	June	S	1
Knoff, Frederick Henry.....	June	S	1
Mills, David McFalls.....	June	SS	1
Nichols, Charles Albert.....	June	S	1
Parker, Howard Roscoe.....	June	SS	1
Post, Charles Dayton.....	June	S	1
Pritchard, Horace B.....	Sep.	S	1
Raynor, Mortimer Williams.....	June	S	1
Shaut, Frank Carpenter.....	June	S	1
Sheffield, Harry Joseph.....	June	S	1
Shepard, Edwin Haddon.....	June	S	1
Teeter, Lorton Holden.....	June	SS	1
Woodruff, James Benjamin.....	June	S	1
<i>University and Bellevue Hospital Med. Coll., New York</i>			
Belcher, Benjamin Hoyt.....	Jan.	S	1
Bernstein, Louis.....	Sep.	SS	1
Bonoff, Harold.....	June	S	1
Claassen, Curtis Frank.....	June	S	1
Crowe, Edwin Raisbeck.....	June	SS	1
Holzappel, William Henry.....	Jan.	S	1
Kempf, Frederick Martin.....	June	SS	1
Kurzweil, Periz Meier.....	June	S	1
Lancaster, Nathaniel Edgar.....	Jan.	S	1
Metz, Benjamin.....	Sep.	S	1
Prager, Jacob Bernard.....	Sep.	S	1
Rosenfeld, Robert.....	Sep.	SS	1
Satchwell, Harry Herbert.....	June	S	1
Scannell, John Matthew.....	Sep.	SS	1
Schaub, Georg.....	June	S	1
Shaftel, Samuel.....	Jan.	S	1
Sharp, John Francis.....	June	S	1
Tanner, Ernest Ketchum.....	Jan.	S	1
Warneke, Frank Herman.....	June	S	1
Waxman, Marks Murray.....	June	S	1
Zlinkoff, Joseph.....	Sep.	S	1
<i>University of Buffalo, medical department</i>			
Andrews, Herman David.....	May	S	1
Foley, Thomas F.....	June	SS	1
a	Jan.	S	1
Hammond, Halley Waldo.....	Jan.	SS	1
Hengerer, Louis.....	June	S	1
Lane, Arthur Garfield.....	June	S	1
Learn, George Emerson.....	Jan.	S	1
Massey, Myrtle Lothrop.....	June	S	1
a Examination incomplete.			

Candidates in partial examinations etc. (continued)

NAME OF CANDIDATE	Date of examination	Board	No. of trials
<i>University of Buffalo, medical department (cont'd)</i>			
Mehl, William M.....	June	S	1
Morris, John Gray.....	June	S	1
Mosshammer, Jesse C.....	Jan.	S	1
Mountain, Stephen V.....	June	S	1
Rice, Victor Moreau.....	June	S	1
Richards, Charles.....	June	S	1
SCHOOLS IN OTHER STATES			
Connecticut			
<i>Yale University, medical department, New Haven</i>			
Clock, Ralph Oakley.....	Jan.	S	1
Ferris, Cleveland.....	Sep.	S	1
Nichols, Henry James.....	Jan.	S	1
Thompson, Hugh Currie.....	June	S	1
Maryland			
<i>Baltimore Medical College</i>			
Hasseltine, Hermon Erwin.....	May	S	1
<i>Baltimore University School of Medicine</i>			
Failed	June	S	18
Failed	June	S	1
<i>Johns Hopkins University, med. dep't, Baltimore</i>			
Giffin, Herbert Ziegler.....	June	S	1
Hemenway, Josephine.....	Sep.	S	1
Stone, Charles Walter.....	June	S	1
<i>School of Med. of the Univ. of Maryland, Baltimore</i>			
Rubinstein, Jacob Louis.....	June	S	1
Michigan			
<i>University of Michigan, Ann Arbor</i>			
Baker, Harold Hill.....	June	H	1
Bennett, Arthur King.....	Sep.	S	1
Graham, Corden T.....	Sep.	H	1
Merkle, Albert Edward.....	Jan.	S	1
Zimmerman, Erastus R.....	May	H	1
New Hampshire			
<i>Dartmouth Medical College, Hanover</i>			
Bishop, Elliot.....	May	S	1
Ohio			
<i>Cleveland Homoeopathic Medical College</i>			
Thompson, Floyd Clayton.....	May	H	1
Webster, Carlos Green.....	May	H	1

Candidates in partial examinations etc. (*continued*)

NAME OF CANDIDATE	Date of examination	Board	No. of trials
<i>Pulte Medical College, Cincinnati</i>			
Wollam, Everett Weston.....	June	H	1
Pennsylvania			
<i>Hahnemann Medical Coll. and Hospital, Philadelphia</i>			
Dye, Adelbert David, Jr.....	May	H	1
Van Keuren, Jesse Philip.....	June	H	1
<i>Jefferson Medical College, Philadelphia</i>			
Thomssen, Herbert William.....	June	S	1
<i>University of Pennsylvania, Philadelphia</i>			
Baker, George Linville.....	June	S	1
Boardman, Carl.....	Sep.	S	1
Bradbury, Samuel, 3d.....	June	S	1
Ellason, Eldridge Lyon.....	June	S	1
Gray, Clarence Hamilton.....	June	S	1
Guthrie, George Donald.....	June	S	1
Janney, Nelson Wilson.....	June	S	1
Lawrance, Jackson Stewart.....	June	S	1
Moore, William Frederic.....	June	S	1
Nicholson, Percival.....	June	S	1
O'Neal, Alexander Hay.....	June	S	1
Piersol, George Morris.....	June	S	1
Prime, Frederick, jr.....	June	S	1
Woodward, William Wellington.....	June	S	1
<i>Western Pennsylvania Medical College, Pittsburg</i>			
Smith, Harry P.....	May	S	1
<i>Woman's Medical College of Pennsylvania, Philadelphia</i>			
Moon, Rachel Tatnall.....	June	S	1
Tracy, Martha.....	June	S	1
Vermont			
<i>University of Vermont, Burlington</i>			
Failed	June	S	1
Shaw, Charles Jay.....	Jan.	S	1

Dentists licensed at examinations Aug. 1, 1902-July 31, 1903

Group 1, New York schools; group 2, schools in other states; group 3, schools in foreign countries.

h means passed the examination with honor, i. e. 90% or above in three fourths of the subjects.

NAME OF CANDIDATE	Preliminary education	Date of graduation	Date of examination	No. of trials
NEW YORK SCHOOLS				
<i>New York College of Dentistry</i>				
Arkin, Samuel Jacob.....	12 counts	1901	Sep.	2
Beck, Louis Leonard.....	B. S.	1903	May	1
Beckel, Melville Jerome.....	36 counts	1903	May	1
Bier, Sigmund.....	36 counts	1903	May	1
Bogen, Frank Anthony.....	36 counts	1902	Sep.	1
Brown, Edwin Stanton.....	4 yr h. s.	1903	June	1
Edwards, Le Roy Sherman.....	4 yr h. s.	1903	May	1
<i>h</i> Faupel, Charles.....	4 yr h. s.	1903	May	1
Flaschl, Piers.....	3 yr h. s.	1902	Sep.	1
Folkers, Oscar Hermann.....	Matric.	1903	May	1
Franck, John.....	Matric.	1902	Sep.	2
Garner, William Francis, jr.....	3 yr h. s.	1903	May	1
Gottfried, John.....	4 yr h. s.	1903	June	1
Grimm, Arthur.....	3 yr h. s.	1903	May	1
<i>h</i> Johnson, Emil John.....	36 counts	1903	May	1
Levien, Edward Isaac.....	36 counts	1902	Sep.	1
Levy, Joseph.....	36 counts	1902	Jan.	1
Lichtenwalner, Charles.....	B. A.	1903	June	1
Liebling, Samuel.....	4 yr h. s.	1903	June	1
Lief, Jacob Feodor.....	36 counts	1903	May	1
Lowenstein, Julius.....	36 counts	1903	June	1
Mills, William Henry, jr.....	36 counts	1903	June	1
Milsner, Henry.....	36 counts	1903	May	1
Mork, Waldo Hutchings.....	3 yr h. s.	1903	June	1
Norcom, Clarence Martense.....	36 counts	1903	June	1
Olsa, Victor.....	3 yr h. s.	1903	June	1
Ortman, Max Jacob.....	36 counts	1903	May	1
Oshlag, Isaac.....	36 counts	1903	May	1
Ranché, Joseph Mota.....	3 yr h. s.	1903	June	1
Ruthfelder, Gottlieb C.....	36 counts	1903	May	1
Raymond, Edward Holman, jr.....	4 yr h. s.	1903	May	1
<i>h</i> Schminke, Oscar.....	3 yr h. s.	1903	May	1
Schwartz, Joseph Mortimer.....	36 counts	1903	May	1
Schwarz, Frederick George.....	36 counts	1903	May	1
Schnayerson, Edward.....	36 counts	1903	June	1
Slout, Julian Nicholas.....	24 counts	1903	June	1
Smith, Augustus Collier.....	3 yr h. s.	1903	May	1
Sniffen, Charles Peck.....	36 counts	1903	May	1
Stillpass, William.....	24 counts	1902	Sep.	1
Stoney, Arthur Crawford.....	3 yr h. s.	1903	June	1
Tepper, Barney.....	36 counts	1903	June	1
<i>h</i> Tillon, Charles Wesley.....	Acad. dip.	1903	May	1
Tomlinson, Edward Sperry.....	3 yr h. s.	1903	May	1
Unger, Nathan.....	36 counts	1903	May	1
Wakefield, Robert.....	3 yr h. s.	1903	June	1

Dentists licensed at examinations etc. (continued)

NAME OF CANDIDATE	Preliminary education	Date of graduation	Date of examination	No. of trials
<i>New York College of Dentistry (cont'd)</i>				
<i>h</i> Weinzweig, Isidor Charles.....	36 counts	1903	May	1
Whaley Edwin Grey.....	3 yr h. s.	1903	June	1
White, Jacob.....	36 counts	1903	May	1
Wolff, Simon Charles.....	36 counts	1901	Jan.	1
Zeitlen, Harry Morton.....	36 counts	1903	June	1
<i>New York Dental School</i>				
Andrews, Marjorie.....	36 counts	1903	May	1
Conkling, Walter Augustus.....	3 yr h. s.	1903	May	1
Demarest, Harry Mott.....	3 yr h. s.	1903	June	1
Fox, Charles Lewis.....	36 counts	1903	June	2
Himowich, Esther.....	3 yr h. s.	1903	Jan.	1
Horwitz, Elizabeth Solomon.....	36 counts	1903	May	1
Kuhl, Henry Andrew.....	36 counts	1903	May	1
McCulloch, Earl C.....	Acad. dip.	1903	June	1
McCulloch, Stephen.....	Acad. dip.	1903	May	1
Sabloff, Louis.....	36 counts	1903	May	1
Shenier, Leib Hirshaw.....	4 yr h. s.	1902	May	1
<i>University of Buffalo, dental department</i>				
Algate, William Ward.....	3 yr h. s.	1903	May	1
Badger, Lee Allyn.....	48 counts	1903	May	1
<i>h</i> Büdecker Charles Francis.....	36 counts	1900	Sep.	1
Brickwedde, George Henry.....	3 yr h. s.	1903	May	1
Failed	24 counts	1901	June	1
Burlingame, Frank Silas.....	3 yr h. s.	1903	June	2
Burlingame, Roy William.....	48 counts	1903	May	1
Bush, William Watson.....	36 counts	1903	May	1
Cantwell, Joseph Jefferson.....	3 yr h. s.	1903	June	1
<i>h</i> Capron, Winfield Byron.....	Acad. dip.	1903	May	1
Charles, Oscar R.....	3 yr h. s.	1903	May	1
Cramer, Charles Mitchell.....	Matric.	1903	May	1
DeCeu, William McClellan.....	36 counts	1903	May	1
Dieffenbach, Arthur Warren.....	36 counts	1903	May	1
Downes, Chester Richard.....	Acad. dip.	1903	May	1
<i>h</i> Elliott, Henry E.....	3 yr h. s.	1903	May	1
Ellis, Walter Healy.....	36 counts	1903	June	2
Evans, Thomas Edward.....	24 counts	1903	June	2
Fish, James Blanchard.....	36 counts	1903	June	1
Fyffe, William Humphorous.....	Acad. dip.	1903	May	1
<i>Gardner</i> George Wilbur.....	36 counts	1903	May	1
<i>h</i> Guillaume, Harland Foster.....	36 counts	1903	May	1
Failed	48 counts	1903	May	1
Herbig, William J.....	36 counts	1903	June	2
Holdridge, Percy A.....	48 counts	1903	May	1
Horton, Ernest Elmer.....	36 counts	1903	May	1
Jenkins, Frank Fayette.....	Acad. dip.	1903	May	1
Landel, <i>Christian Albert</i>	Matric.	1898	Sep.	2
Lane, William Henry.....	36 counts	1903	May	1
Leek, Clarence A.....	36 counts	1903	May	1
Leonard, Ross Garfield.....	36 counts	1903	May	1
Lewis, Charles Edward, jr.....	48 counts	1902	Jan.	2

a Examined in June 1900, license held for completion of requirements.

Dentists licensed at examinations etc. (continued)

NAME OF CANDIDATE	Preliminary education	Date of graduation	Date of examination	No. of trials
<i>University of Buffalo, dental dep't (cont'd)</i>				
Lockwood, John Augustus.....	3 yr h. s.	1903	May	1
McElroy, William Wescott.....	36 counts	1903	May	1
McIlroy, George Alton.....	4 yr h. s.	1903	May	1
Failed	36 counts	1903	June	2
Main, David Talbot.....	3 yr h. s.	1903	May	1
Marlatt, Milton Ross.....	3 yr h. s.	1903	June	2
Millis, Henry Clay.....	36 counts	1903	June	2
Montgomery, Warren Ray.....	48 counts	1903	May	1
Mulcahy, Lawrence Lee.....	48 counts	1903	May	1
Newcomb, Harvey Hotchkiss.....	Acad. dip.	1903	May	1
Northrup, DeWitt Clinton.....	Acad. dip.	1903	May	1
O'Brien, Thomas Francis.....	3 yr h. s.	1903	June	2
Failed	36 counts	1903	June	2
Rose, Clifford Ezra.....	3 yr h. s.	1903	May	1
Rowland, Charles Edward.....	3 yr h. s.	1903	May	1
a	36 counts	1903	June	1
hTanner, Harry Flagler.....	Acad. dip.	1903	May	1
Tanzer, William B.....	Acad. dip.	1903	May	1
Thomas, Clarence Hovey.....	Acad. dip.	1903	May	1
Failed	3 yr h. s.	1903	May	1
Todd, Edwin La Fayette.....	3 yr h. s.	1903	May	1
c	Acad. dip.	1903	May	1
Turner, Richard V.....	36 counts	1903	May	1
Vedder, Daniel James, jr.....	3 yr h. s.	1903	May	1
Wilson, Florence E. Wrean.....	Acad. dip.	1903	May	1
Wilson, Wiley Hardy.....	3 yr h. s.	1903	May	1
SCHOOLS IN OTHER STATES				
District of Columbia				
<i>Columbian University, Washington</i>				
hStevens, Henry Pennepacker.....	3 yr h. s.	1902	Jan.	1
Illinois				
<i>Chicago College of Dental Surgery</i>				
hAnderson, Gustave Adolph.....	3 yr h. s.	1901	Sep.	1
O'Sullivan, John J.....	3 yr h. s.	1901	Sep.	1
<i>Northwestern Univ. Dental Sch., Chicago</i>				
Constable, Roy Verner.....	4 yr h. s.	1902	Sep.	2
Hargett, Arthur Vernon.....	Matric.	1898	Jan.	1
Maryland				
<i>Baltimore College of Dental Surgery</i>				
Allen, Bert Frank.....	3 yr h. s.	1903	May	1
Grace, Thomas Merritt.....	3 yr h. s.	1900	Jan.	1
hMable, William Arba.....	48 counts	1903	June	1

a Examination incomplete.

Dentists licensed at examinations etc. (continued)

NAME OF CANDIDATE	Preliminary education	Date of graduation	Date of examination	No. of trials
<i>University of Maryland, dent. dep't, Baltimore</i>				
Barr, George Wallace.....	3 yr h. s.	1902	Sep.	2
Becker, Charles Francis.....	3 yr h. s.	1902	Jan.	1
Bishop, Charles G.....	3 yr h. s.	1902	Sep.	2
Ide, Ira Charles.....	36 counts	1903	June	1
Lynch, Charles Godfrey.....	24 counts	1902	Jan.	1
Norton, Oakley Worden.....	3 yr h. s.	1900	Sep.	1
Massachusetts				
<i>Harvard University, dental school, Boston</i>				
hCohen, Bernhard.....	B. A.	1903	June	1
Failed	Matric.	1898	June	1
Failed	Matric.	1899	June	1
<i>Tufts College Dental School, Boston</i>				
hShaw, George Maurice.....	4 yr h. s.	1903	June	1
Michigan				
<i>Univ. of Michigan, dent. dep't, Ann Arbor</i>				
Failed	36 counts	1903	June	1
Ohio				
<i>Cincinnati College of Dental Surgery</i>				
Failed	Matric.	1898	May	1
Pennsylvania				
<i>Pennsylvania Coll. of Dent. Surg., Phila.</i>				
Bickelhaupt, Albert Charles.....	36 counts	1903	May	1
Failed	Matric.	1898	Jan.	2
Herbst, Louis.....	8 yr h. s.	1902	Jan.	1
Hindes, Albert G.....	36 counts	1902	May	1
Hodge, Harry E.....	36 counts	1903	May	1
Pitcher, Frank Clifford.....	8 yr h. s.	1903	June	2
Prichard, Joshua Thomas.....	3 yr h. s.	1902	Sep.	1
Solot, Morris L.....	48 counts	1903	May	1
<i>Philadelphia Dental College</i>				
Failed	36 counts	1902	May	1
Crisp, Harton Alfred.....	Matric.	1902	Sep.	1
DeGroot, Hugh Irving.....	8 yr h. s.	1903	June	1
Feinberg, Cecilia.....	36 counts	1900	Jan.	1
Hines, John Percy.....	Matric.	1898	Sep.	1
McKinley, George Collinson.....	3 yr h. s.	1902	June	1
Storck, Stephen O.....	3 yr h. s.	1900	June	1
Failed	4 yr h. s.	1903	June	1

Dentists licensed at examinations etc. (continued)

NAME OF CANDIDATE	Preliminary education	Date of graduation	Date of examination	No. of trials
<i>Univ. of Pennsylvania, dent. dep't., Phila.</i>				
Barone, Walter A.	Acad. dip.	1903	June	1
Bigham, Leon T.	36 counts	1902	Jan.	2
Brash, William Wheeler.	48 counts	1903	June	1
hCallaghan, Charles Frank.	4 yr h. s.	1903	June	1
Conlon, Thomas Joseph.	3 yr h. s.	1899	Jan.	1
De Lana, Leverett Curtis.	3 yr h. s.	1902	June	1
hHertz, Clarence Henry.	3 yr h. s.	1902	Sep.	1
Hodgkins, Nathan W.	4 yr h. s.	1903	June	1
Johnson, Lucius Warren.	48 counts	1903	June	1
Kaufmann, Charles Maurice.	36 counts	1902	May	2
Mocenter, Henry.	36 counts	1903	June	1
Montfort, Clive Wager.	3 yr h. s.	1902	Sep.	1
Rowley, Homer Sexton.	3 yr h. s.	1903	June	1
Seeley, Bert.	48 counts	1903	June	1
Spangenberg, Harry Dufford.	4 yr h. s.	1902	Jan.	1
Stillman, Ernest E.	3 yr h. s.	1902	Sep.	2
hSuffern, Edward Russell.	3 yr h. s.	1903	June	1
Failed.	3 yr h. s.	1903	June	1
Wasley, Leon Tucker.	3 yr h. s.	1902	Jan.	2
White, William Dwight, jr.	3 yr h. s.	1901	Sep.	2
SCHOOLS IN FOREIGN COUNTRIES				
France				
<i>Academy of Paris</i>				
Diploma signed by minister of public instruction				
Dembski, Rosalie.	Matric.	1896	Sep.	2
<i>Dental School of Paris</i>				
Hodel, Esther Livchitz.	3 yr h. s.	1900	Jan.	1

Dentists licensed at examinations Aug. 1, 1902–July 31, 1903

UNDER EXEMPTION LAWS 1895, CH. 626, §163

NAME OF CANDIDATE	Date of examination	No. of trials
Kimpton, Earl Alpheus.....	Sep.	4
Sissenberger, Charles.....	June	1
UNDER EXEMPTION LAWS 1902, CH. 210		
Failed	June	1
Fassmann, Frank A.....	Jan.	1
Hunter, Virgil L.....	May	1
Janofsky, Anton Emanuel Marinues.....	Jan.	3
Failed	June	1
Lascel, Ernest R.....	May	1
MacGachen, Archibald Meredith.....	May	1
McIntosh, Charles Everett.....	May	1
Mindling, Bernard.....	May	1
Moyer, Howard Herman.....	May	1
Paxson, Gracia Abigail Naomi.....	May	1
^a	May	1
Failed	June	1
Skinner, James H.....	Sep.	1
Failed	June	1
Failed	June	1
Failed	June	2
Failed	June	1
Watts, Charles Bongie.....	June	2
Wengenroth, William Frederick.....	June	2
Failed	June	1

^a Requirements not yet fully met.

Veterinarians licensed at examinations Aug. 1, 1902-July 31, 1903

NAME OF CANDIDATE	Date of graduation	Date of examination	No. of trials
NEW YORK SCHOOLS			
<i>American Veterinary College, New York</i>			
Failed	1898	Jan.	3
Hazel, George Alexander	1902	Sep.	2
Stark, Herman	1903	June	1
<i>New York College of Veterinary Surgeons</i>			
Failed	1899	Sep.	3
aGilbert, Niran O.	1898	Sep.	3
<i>New York State Veterinary College, Ithaca</i>			
Davenport, Miles Leroy	1903	June	1
Fehr, Frederic Frank	1903	June	1
Hughes, David Arthur	1903	June	1
Le Fevre, Daniel Du Bois	1903	June	1
hLoomis, Frank James	1903	June	1
Lueder, Charles Augustus	1902	Jan.	3
hMillen, Charles	1903	June	1
Simons, Fred Bertrand	1903	June	1
Smith, Ernest Ireland	1903	June	1
Stroud, Bert Brenette	1903	June	1
Wilbur, Bert Raymond	1903	June	1
b	1903	June	1
SCHOOLS IN OTHER STATES			
Illinois			
<i>Chicago Veterinary College</i>			
Spencer, Corte Judson	1903	June	1
SCHOOLS IN FOREIGN COUNTRIES			
Canada			
<i>McGill University, veterinary dep't, Montreal</i>			
Greer, John	1896	June	2
<i>Ontario Veterinary College, Toronto</i>			
Nutting, Lewis A.	1896	Sep.	2

a Also holds diploma from Ontario Veterinary College, Toronto 1896.

b Examination incomplete.

C. P. A. certificates issued at examinations Aug. 1, 1902–July 31, 1903

NAME OF CANDIDATE	Date of examination	No. of trials
Failed	June	1
Failed	June	1
Failed	Jan.	2
Bayer, Walter Alonzo (junior certificate)	June	1
Failed	Jan.	3
Failed	June	2
Failed	June	1
Failed	Jan.	2
Failed	June	2
Failed	June	1
Failed	Jan.	2
Failed	June	4
Failed	June	1
^a	June	1
Failed	June	1
Failed	June	2
Failed	Jan.	2
Failed	Jan.	2
Freeman, William Egerton (junior certificate)	June	4
Failed	June	1
Failed	June	1
Harned, Franklin Moore (junior certificate)	Jan.	3
Failed	June	1
Failed	June	3
Failed	June	3
Failed	June	1
Failed	Jan.	2
Failed	June	2
Failed	June	2
Pelrce, Thomas Wentworth	Jan.	2
Failed	June	2
Failed	Jan.	3
Rafter, Adolphe	Jan.	2
Ridgway, James Lawrence (junior certificate)	Jan.	2
Robinson, Edward C. (waiting decision of board)	June	4
^b Rucker, Robert Hamilton	June	2
Failed	June	2
Failed	June	3
Failed	June	1
Failed	June	1
Sinclair, George (junior certificate)	Jan.	2
Failed	Jan.	1
Failed	June	1
Failed	June	2
Stellwagen, Frank W. (junior certificate)	June	3
Failed	Jan.	3
Failed	June	1
Failed	June	2
Thomas, Charles	June	4
Failed	June	1
Failed	Jan.	2
Failed	Jan.	2
Failed	June	2
Failed	June	3

^a Examination incomplete.^b Examined in June 1902.

3 LICENSES ISSUED BY THE UNIVERSITY WITHOUT EXAMINATION

Under exemptions in the professional laws the University has also issued licenses during the year to: 69 physicians; 36 dentists; 6 veterinarians and 3 certified public accountants.

Indorsement of medical diplomas Aug. 1, 1902-July 31, 1903

LAWS OF 1893, CH. 661, §148, ¶2

To make valid imperfect registrations

NAME OF PHYSICIAN	Date	Board
NEW YORK SCHOOLS		
<i>Bellerue Hospital Medical College, New York</i>		
Marren, Rosemound Witherspoon.....	Oct.	S
<i>College of Physicians and Surgeons, New York</i>		
Lewis, William Jerauld.....	July	S
SCHOOLS IN OTHER STATES		
Michigan		
<i>University of Michigan, Ann Arbor</i>		
Miller, George Washington.....	Aug.	S
<i>University of Michigan, Ann Arbor</i>		
Gleason, Adèle Amella.....	Sep.	S
McGowan, Hiram.....	May	S
Sheldon, Floyd Preston.....	Oct.	H
New Hampshire		
<i>Dartmouth Medical College, Hanover</i>		
Land, Joseph Foster.....	Oct.	H
Thompson, George Seeley.....	July	S
Pennsylvania		
<i>Hahnemann Medical College and Hospital, Philadelphia</i>		
Wilson, Thomas J.....	Dec.	H
<i>University of Pennsylvania, Philadelphia</i>		
Bennett, George D.....	Dec.	S
Texas		
<i>Texas Medical College and Hospital, Galveston</i>		
O'Brien, John A.....	Feb.	S
Vermont		
<i>University of Vermont, Burlington</i>		
Post, Henry Watrous.....	May	S

LAWS OF 1893, CH.661, §148

Matriculates in New York State medical schools before June 5, 1890

Group 1, New York schools; group 2, schools in other states

NAME OF PHYSICIAN	Date
NEW YORK SCHOOLS	
<i>Albany Medical College</i>	
Stockwell, George Archie.....	July
<i>Belleue Hospital Medical College, New York</i>	
Bennett, Porton Rivolo, Jr.....	June
Loomis, Albert Jerome.....	June
McCurdy, Ira Jay.....	July
Smith, Ethan Henry.....	Mar.
<i>College of Physicians and Surgeons, New York</i>	
Jackson, John Alexander.....	Nov.
<i>New York Homeopathic Medical College</i>	
Curran, Edwin John.....	Feb.
Lewis, Eldon E.....	June
<i>New York University, medical department</i>	
Rankin, William David.....	May
Wright, Joseph Bidmead.....	Ap.
<i>Syracuse University, medical department</i>	
Swartz, Herbert Woodworth.....	Aug.
SCHOOLS IN OTHER STATES	
Georgia	
<i>Georgia College of Eclectic Medicine and Surgery, Atlanta</i>	
Stryker, Mary Frances.....	July
Ohio	
<i>Medical College of Ohio</i> (University of Cincinnati)	
Bowen, Arthur Hosmer.....	Nov.
<i>Western College of Homeopathic Medicine, Cleveland</i>	
Beckwith, Seth R.....	Oct.

LAWS OF 1893, CH. 661, §150

For registry in another county

Group 1, New York schools; group 2, schools in other states; group 3, foreign countries

NAME OF PHYSICIAN	Date
NEW YORK SCHOOLS	
<i>Bellevue Hospital Medical College, New York</i>	
Cornelius, La Willa Mott.....	Nov.
Edmister, Frederick	Sep.
Fiske, William McL.....	Feb.
Jacobus, Arthur Middleton.....	Ap.
Morse, William H.....	Ap.
Rapp, Samuel	Dec.
Rosenberg, Leopold	June
Savage, Frederick A.....	Dec.
<i>College of Physicians and Surgeons, New York</i>	
Donovan, William Francis.....	Oct.
Frankel, Edward	July
Gray, Joseph Francis.....	Feb.
Guth, William Charles.....	Mar.
Michaelis, Ludwig Mitchel.....	July
Rodger, David R.....	Ap.
Swift, Ezra L'Honmedieu.....	Nov.
<i>Eclectic Medical College of the City of New York</i>	
Davis, Eber E.....	June
Hammond, William Randolph.....	July
<i>Geneva Medical College</i>	
Preston, Byron I.....	Mar.
<i>New York University, medical department</i>	
Brunner, William John.....	Dec.
Dunster, William Romanoff.....	Jan.
Fischer, Louis	Ap.
MacCauley, Henry A.....	Nov.
Morrow, Benjamin Rowland.....	Jan.
Muttart, Alder Charles.....	Nov.
Roberts, Lemuel Gardner.....	Sep.
Romero, Genaro Antonio.....	June
Stone, William Fletcher.....	Dec.
Talmage, Thomas Goyu.....	Dec.
Tucker, Charles Joshua.....	Mar.
Wilson, George Edward.....	Dec.
Winter, Henry Lyle.....	Oct.
<i>Niagara University, medical department</i>	
Milbring, Edwin Andrew.....	Sep.
<i>University of Buffalo, medical department</i>	
Blanchard, Amos Flint.....	Oct.
Elliott, Robert M.....	Jan.
Foy, Maud M.....	Oct.
Meeder, Elwood Daniel.....	June
Melsburger, William C. L.....	Aug.
Pawling, Thomas H.....	Dec.

For registry in another county (continued)

NAME OF PHYSICIAN	Date
<i>Censors certificate of Hudson River Ec. Med. Soc., Poughkeepsie</i> Jones, Edward Townsend.....	Mar.
<i>Certificate from New York State Medical Society</i> Goodell, Richard Henry.....	Nov.
SCHOOLS IN OTHER STATES	
Maryland	
<i>School of Medicine of the University of Maryland, Baltimore</i>	
Indorsed by Bellevue Hospital Medical College	
McKeeby, William Coe.....	Jan.
Michigan	
<i>University of Michigan, Ann Arbor</i>	
Spicer, Walter Erastus.....	June
Ohio	
<i>Cleveland Homeopathic Hospital College</i>	
Rodenberger, Edwin M.	Nov.

Summary of medical diplomas indorsed Aug. 1, 1902—July 31, 1903*New York*

Albany Medical College.....	1
Bellevue Hospital Medical College, New York.....	13
College of Physicians and Surgeons, New York.....	9
Eclectic Medical College of the City of New York.....	2
Geneva Medical College.....	1
New York Homeopathic Medical College.....	2
New York University, medical department.....	15
Niagara University, medical department.....	1
Syracuse University, medical department.....	1
University of Buffalo, medical department.....	6
Censors certificate of the Hudson River Eclectic Medical Society, Poughkeepsie	1
Certificate from New York State Medical Society.....	1

*Other states***Georgia**

Georgia College of Eclectic Medicine and Surgery, Atlanta	1
--	---

Maryland

School of Medicine of the University of Maryland, Baltimore	1
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Michigan

Detroit College of Medicine.....	1
University of Michigan, Ann Arbor.....	4

New Hampshire

Dartmouth Medical College, Hanover.....	2
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Ohio

Cleveland Homeopathic Hospital College.....	1
Medical College of Ohio (University of Cincinnati) ...	1
Western College of Homeopathic Medicine, Cleveland.	1

Pennsylvania

Hahnemann Medical College and Hospital, Philadel- phia	1
University of Pennsylvania, Philadelphia.....	1

Texas

Texas Medical College and Hospital, Galveston.....	1
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Vermont

University of Vermont, Burlington.....	1
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Total	<u>69</u>
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Indorsement of dental diplomas Aug. 1, 1902-July, 31, 1903

LAWS OF 1893, CH. 661, AS AMENDED BY LAWS OF 1895, CH. 626; 1896, CH. 297

On certificate of dental examiners

NAME OF CANDIDATE	Date
NEW YORK SCHOOLS	
<i>New York College of Dentistry</i>	
Euler, George Henry (New Jersey license).....	Nov.
Payne, John Gordon (New Jersey license).....	Oct.
OTHER STATES	
Colorado	
<i>University of Denver, dental department</i>	
Raub, Herschel David.....	Nov.
District of Columbia	
<i>Howard University, Washington</i>	
Neal, Charles Arthur.....	Ap.
Illinois	
<i>Chicago College of Dental Surgery</i>	
Wilson, Lorenzo Shepherd.....	Sep.
Maryland	
<i>Baltimore College of Dental Surgery</i>	
Lafin, Edward Grant.....	Jan.
Massachusetts	
<i>Boston Dental College</i>	
Russell, Burton Charles.....	Nov.
Michigan	
<i>University of Michigan, dental department, Ann Arbor</i>	
Bethel, Lou Prentiss.....	May
Carmichael, John Peter.....	May
De Puy, Hiram.....	Feb.
Pennsylvania	
<i>Pennsylvania College of Dental Surgery, Philadelphia</i>	
Angle, Edward Hartley.....	Feb.
<i>University of Pennsylvania, dental department, Philadelphia</i>	
Croll, William L.....	May
Peter, Henry Herman (New Jersey license).....	Nov.
Singer, John Gray (New Jersey license).....	Nov.
Slade, Arthur Roland (New Jersey license).....	Nov.
Stanley, Rolof Beuckert.....	Feb.
Walker, Samuel Albert.....	Dec.
Tennessee	
<i>Vanderbilt University, dental department, Nashville</i>	
Jordan, Hamet.....	Ap.
Winfrey, Clint Crockett.....	July

Indorsement of dental diplomas Aug. 1, 1902-July 31, 1903

LAWS OF 1893, CH.661 AS AMENDED BY LAWS OF 1895, CH.626; 1896, CH.297

For registry in another county

NAME OF CANDIDATE	Date
NEW YORK SCHOOLS	
<i>New York College of Dentistry</i>	
Beale, James M.....	Oct.
Byers, John Murray.....	Oct.
Knapp, James Franklin.....	May
Ludlum, Fred Willett.....	Nov.
<i>Transcript of registration in Allegany county</i>	
Raub, Lewis M.....	Sep.
<i>Transcript of registration in Erie county</i>	
Mann, George E.....	June
<i>Transcript of registration in New York county</i>	
Carlos, John W.....	Aug.
Huntington, William S.....	Mar.
<i>Transcript of registration in Oneida county</i>	
Lloyd, George H.....	May
<i>Transcript of registration in Oswego county</i>	
Baker, Daniel Almer.....	Oct.
Van Vleck, Charles H.....	Nov.
<i>Transcript of registration in Tioga county</i>	
Snook, Frederick M.....	Nov.
OTHER STATES	
Illinois	
<i>Chicago College of Dental Surgery</i>	
Cady, Frank William.....	Jan.
Indiana	
<i>Indiana Dental College, Indianapolis</i>	
McNeille, P. R.....	May
Maryland	
<i>University of Maryland, Baltimore</i>	
Williams, Maynard Elliott.....	Mar.
Pennsylvania	
<i>Philadelphia Dental College</i>	
Tibbetts, Samuel.....	Ap.
<i>University of Pennsylvania, dental department, Philadelphia</i>	
Lawton, Burtis E.....	June

Summary of dental diplomas indorsed Aug. 1, 1902-July 31, 1903

New York

New York College of Dentistry.....	6
Transcript of registration in Allegany county.....	1
Transcript of registration in Erie county.....	1
Transcript of registration in New York county.....	2
Transcript of registration in Oneida county.....	1
Transcript of registration in Oswego county.....	2
Transcript of registration in Tioga county.....	1

Other states

Colorado

University of Denver, dental department.....	1
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District of Columbia

Howard University, Washington.....	1
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Illinois

Chicago College of Dental Surgery.....	2
--	---

Indiana

Indiana Dental College, Indianapolis.....	1
---	---

Maryland

Baltimore College of Dental Surgery.....	1
--	---

University of Maryland, Baltimore.....	1
--	---

Massachusetts

Boston Dental College.....	1
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Michigan

University of Michigan, dental dep't, Ann Arbor.....	3
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Pennsylvania

Pennsylvania College of Dental Surgery, Philadelphia.	1
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Philadelphia Dental College.....	1
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University of Pennsylvania, dental dep't, Philadelphia	7
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Tennessee

Vanderbilt University, dental dep't, Nashville.....	2
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Total	36
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Indorsement of veterinary diplomas Aug. 1, 1902-July 31, 1903

LAWS OF 1893, CH.661, §179, AS AMENDED BY LAWS OF 1895, CH.860

Matriculates in New York State veterinary medical schools *before July 1, 1896*

NAME OF CANDIDATE	Date
NEW YORK SCHOOLS	
<i>American Veterinary College, New York</i>	
Huelsen, Julius	June
<i>Columbia Veterinary College, New York</i>	
Johnston, David L.	Ap.
<i>New York College of Veterinary Surgeons</i>	
Johnston, Alexander	Mar.

LAWS OF 1893, CH.661, AS AMENDED BY LAWS OF 1895, §181

For registry in another county

NAME OF CANDIDATE	Date
NEW YORK SCHOOLS	
<i>Columbia Veterinary College, New York</i>	
Walton, Frank	Dec.
<i>Transcript of registration in Chautauqua county</i>	
Smith, Charles William	Ap.

LAWS OF 1893, CH.661, AS AMENDED BY LAWS OF 1895, 1896, 1900 AND 1901, §179

On certificate of veterinary examiners

NAME OF CANDIDATE	Date
Denison, Nathan H.	June

Summary of veterinary diplomas indorsed Aug. 1, 1902—July 31, 1903*New York*

American Veterinary College, New York.....	1
Columbia Veterinary College, New York.....	2
New York College of Veterinary Surgeons.....	1
Transcript of registration in Chautauqua county.....	1
Certificate of veterinary examiners.....	1
Total	6

Certified public accountants

During the year ending July 31, 1903, 3 C. P. A. certificates were issued without examination under the requirements of rule 4.

Decker, Hiram E.

Schneider, Frederick

Dunning, Alden W.

4 CALENDAR OF
Dates, credentials

DATE	LAW, MEDICAL, DENTAL AND VETERINARY STUDENT	M.D. DEGREE	D.D.S. DEGREE	MEDICAL LICENSE	DENTAL LICENSE	VETERINARY LICENSE
1902 S 23 26	Albany, Buffa- lo, New York, Syracuse			Albany, Buffalo, New York, Syracuse	Albany, Buffalo, New York, Syracuse	Albany, Buffalo, New York, Syracuse
N 17						
D 19						
D 20						
1903 Ja 26 30	Albany, Buffa- lo, New York, Syracuse			Albany, Buffalo, New York, Syracuse	Albany, Buffalo, New York, Syracuse	Albany, Buffalo, New York, Syracuse
F 28						
Mr 26-27	Albany, Buffa- lo, New York, Syracuse					
My 19 23			New York	Albany, Buffalo, New York, Syracuse	Albany, Buffalo, New York, Syracuse	Albany, Buffalo, New York, Syracuse
My 23						
Je 15-19	Albany, Buffa- lo, New York, Syracuse					
Je 20						
Je 23-27		New York	New York	Albany, Buffalo, New York, Syracuse	Albany, Buffalo, New York, Syracuse	Albany, Buffalo, New York, Syracuse, Ithaca

EXAMINATIONS 1903

and subjects

EXTENSION	PUBLIC ACCOUNTING	STATE BUSINESS CREDENTIALS	LIBRARY	SUBJECTS
				25 academic, 7 medical, 8 dental, 7 veterinary
			Albany	Elementary classification
			Albany	Elementary bibliography
New York.				Nature study
	New York.			67 academic, 9 business, 7 medical, 8 dental, 7 veterinary, 4 C. P. A.
			Albany.....	Advanced dictionary cataloguing
			Albany.....	26 academic, 6 library, 2 business
				7 medical, 8 dental
New York.				7 veterinary
	New York, Buffalo	Albany, Buffalo, Syracuse, and in 500 academies and high schools of the state	Albany N. Y. New York N. Y. Wellesley Mass.	2 extension, 69 academic, 9 business, 4 C. P. A., 10 library
New York.				Genetic psychology
			Albany.....	7 medical, 8 dental, 7 veterinary

5 COLLEGES, PROFESSIONAL, TECHNICAL AND OTHER SPECIAL SCHOOLS

CLASSIFICATION	NUMBER		FACULTY		STUDENTS		
	1902	1903	Men	Women	Men	Women	Total
Colleges for men...	21	21	598	8	3 198	.....	3 198
Colleges for women	5	5	112	186	.....	3 921	3 921
Colleges for men & women	7	7	249	43	1 885	1 103	2 488
Theology	16	16	173	8	947	22	969
Law	7	8	133	1	2 563	55	2 618
Education	8	8	72	85	755	1 887	2 642
Medicine	13	13	1 147	32	3 568	154	3 722
Dentistry	8	8	114	1	867	36	903
Pharmacy	5	5	56	.....	689	30	699
Veterinary	2	2	50	.....	251	.....	251
Eye and ear	1	1	24	2	6	1	7
Engineering and technology ¹	6	7	226	1	2 447	14	3 461
Architecture	1	2	15	.....	135	1	136
Art	3	3	32	25	167	1 106	1 273
Music	4	4	56	38	245	942	1 187
Other	a11	a11	a413	a101	a2 327	a2 405	a4 733
Special	b6	c7	c197	c42	c5 846	c3 229	c9 075
Total	114	118	d3 308	563	d25 029	d14 689	d39 718

¹Including the graduate departments of Columbia, Cornell and New York universities. ²Not including Chautauqua or New York branch of Catholic Summer School. ³Not including New York branch of Catholic Summer School. ⁴Omitting items duplicated.

Colleges, professional, technical etc. (continued)

FIRST DEGREES CONFERRED ON EXAMINATION			NET PROPERTY	EXPENDITURES
Classification	1902	1903	1903	1903
Colleges for men	591	580	\$31 550 809 ..	\$3 278 855 85
Colleges for women	539	781	6 275 621 54	1 780 912 80
Colleges for men & women ..	405	376	16 502 190 80	1 657 579 25
Theology	35	33	11 271 627 12	811 300 09
Law	531	521	979 037 76	251 440 61
Education	87	117	2 587 085 12	788 022 13
Medicine	404	513	5 813 452 56	493 810 12
Dentistry	131	124	124 467 93	133 474 70
Pharmacy	258	212	202 092 44	100 493 53
Veterinary	16	24	158 191 46	32 997 03
Eye and ear	1	3	f100 000 ..	890 ..
Engineering & technology ..	286	360	1 383 156 56	128 352 58
Architecture	8	13	.....	.....
Art	21	11	29 540 11	25 010 23
Music	3	3	69 129 18	38 726 12
Other	a314	a319	a4 686 841 83	a293 718 25
Special	b23	c51	c4 643 048 89	c250 685 96
Total	3 653	4 041	\$86 875 792 30	\$10 061 269 25

aIncluding the graduate departments of Columbia, Cornell and New York universities.
bNot including Chautauqua or New York branch of Catholic Summer School. cNot including New York branch of Catholic Summer School. dIn this table several institutions with more than one department which failed to give separate statistics for each department are included. For example, the net property for colleges for men includes all departments of Columbia except law and medicine, the school of applied science of New York University, Hamilton Theological Seminary, medical, pharmaceutical and preparatory departments of Syrian Protestant College. Under colleges for men and women is included property used by the colleges of fine arts and applied science of Syracuse University, academic department of Keuka, and all departments of Cornell except forestry, medical, veterinary and law. The figures for these departments are of course omitted from the heads under which they should appear. fProperty of hospital and college used in common.

6 NUMBER OF HIGHER INSTITUTIONS 1893-1903, THE DECADE'S GROWTH AND THE AVERAGE ANNUAL INCREASE

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	INCREASE	
												Decade	Aver. an.
Colleges for men.....	21	22	22	22	22	23	23	23	23	21	21	.....	.....
Colleges for women.....	8	8	6	6	5	5	5	5	5	5	5	-3	-.8
Colleges for men and women.....	6	5	4	4	4	5	6	6	7	7	7	1	-.1
Theology.....	10	12	12	13	13	13	14	16	16	16	16	6	.6
Law.....	7	7	7	7	7	7	7	7	7	7	8	1	.1
Education.....	3	3	3	4	4	4	3	3	3	3	3	.....	.....
Medicine.....	15	15	15	15	15	15	14	13	13	13	13	-2	-.2
Dentistry.....	3	3	3	3	3	3	3	3	3	3	3	.....	.....
Pharmacy.....	4	4	4	5	5	5	5	5	5	5	5	1	.1
Veterinary.....	2	2	2	2	3	3	3	2	2	2	2	.....	.....
Eye and ear.....	1	1	1	1	1	1	1	1	1	1	1	.....	.....
Engineering and technology.....	2	2	2	2	3	3	5	6	6	6	7	5	.5
Architecture.....	.....	.....	.....	.....	.....	.....	1	1	1	1	1	.....	.....
Art.....	1	1	1	1	1	.....	2	3	3	3	2	2	.2
Music.....	1	3	4	4	4	4	4	4	4	4	4	3	.3
b Others.....	5	5	5	7	7	7	9	9	11	11	11	6	.6
Special.....	4	7	6	6	6	7	7	8	8	8	8	5	.5
Total.....	93	100	97	102	104	108	112	115	117	116	119	27	2.7

^a These statistics have been carefully revised to make them accord with the present method of reporting. ^b Including the graduate departments of Columbia, Cornell and New York Universities.

First degrees conferred on examinations 1893-1903, the decade's growth and the average annual increase

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	INCREASE	
												Decade	Aver. an.
Colleges for men.....	407	437	463	417	405	460	506	525	488	591	580	173	17.3
Colleges for women.....	209	215	230	262	245	248	266	328	419	539	781	572	57.2
Colleges for men and women.....	341	302	320	354	379	360	269	290	309	405	376	35	3.5
Theology.....	6	5	8	6	14	27	28	29	26	35	38	27	2.7
Law.....	419	411	381	409	463	513	433	460	488	531	521	102	10.2
Education.....	38	30	39	41	54	74	64	72	81	87	117	79	7.9
Medicine.....	626	559	682	692	569	670	637	463	409	404	513	-113	-11.3
Dentistry.....	52	68	117	113	152	130	114	69	118	131	134	72	7.2
Pharmacy.....	137	178	154	207	214	236	218	218	252	258	212	55	5.5
Veterinary.....	73	64	52	55	41	40	16	15	17	16	24	-49	-4.9
Eye and ear.....	.....	13	2	5	1	9	4	8	8	1	3	8	3
Engineering and technology.....	44	89	93	76	85	116	203	220	271	286	860	816	31.6
Architecture.....	.....	.....	.....	.....	.....	.....	8	10	6	8	13	13	1.3
Art.....	.....	.....	.....	.....	.....	.....	.....	21	14	21	11	11	1.1
Music.....	.....	.....	.....	4	2	2	4	1	.....	8	8	8	3
Others.....	34	49	45	135	141	191	178	191	259	314	319	285	28.5
Special.....	22	20	12	25	13	22	22	28	24	23	51	29	2.9
Total.....	2 428	2 440	2 598	2 801	3 868	3 098	2 970	2 943	3 184	3 653	4 041	1 613	161.3

b Including the graduate departments of Columbia, Cornell and New York Universities.

Faculties of higher institutions 1893-1903, the

	1893	1894	1895	1896
Colleges for men, men.....			443	549
women.....				
total.....	487	492	443	549
Colleges for women, men.....			51	69
women.....			121	118
total.....	171	191	172	187
Colleges for men and women, men.....			224	276
women.....			18	22
total.....	215	215	237	298
Theology, men.....			74	131
women.....			2	2
total.....	80	83	76	133
Law, men.....			107	181
women.....				
total.....	71	103	107	131
Education, men.....			34	46
women.....			50	54
total.....	65	71	84	100
Medicine, men.....			764	920
women.....			54	45
total.....	704	838	818	965
Dentistry, men.....			88	109
women.....				
total.....	69	67	88	109
Pharmacy, men.....			32	45
women.....			1	
total.....	26	27	33	45
Veterinary, men.....			37	38
women.....				
total.....	31	36	37	38
Eye and ear, men.....			21	23
women.....			2	
total.....	12	12	23	23

decade's growth and average annual increase

1897	1898	1899	1900	1901	1902	1903	INCREASE	
							In eight years	Aver. annual
539 1	515	526	553	549	576 4	598 8	155 3	19
540	515	526	553	549	580	601	<i>f</i> 114	<i>f</i> 11
96	92	98	94	99	91	112	61	8
127	145	148	169	173	198	186	65	8
223	237	246	263	272	289	298	<i>f</i> 127	<i>f</i> 13
346	326	323	230	236	242	249	25	3
23	35	36	19	34	32	43	30	4
369	361	359	249	270	274	292	<i>f</i> 77	<i>f</i> 8
150	131	169	195	171	186	173	99	12
2	1	1	1	2	3	3	1	.....
152	132	170	196	173	189	176	<i>f</i> 96	<i>f</i> 10
129	114	119	123	122	119	133	26	3
.....	1	1	1	1	1	1	1	.....
129	115	120	124	123	120	134	<i>f</i> 63	<i>f</i> 6
43	57	56	70	86	80	72	38	5
57	53	52	58	60	68	85	35	4
100	110	108	128	146	148	157	<i>f</i> 92	<i>f</i> 9
908	957	978	1 035	1 054	1 103	1 147	333	48
50	49	47	21	36	27	32	—22	—3
958	1 006	1 025	1 056	1 090	1 130	1 179	<i>f</i> 475	<i>f</i> 48
107	113	104	102	102	105	114	26	3
.....	2	.....	.....	.....	.....	1	1	.....
107	115	104	102	102	105	115	<i>f</i> 46	<i>f</i> 5
49	57	54	52	54	56	56	24	3
.....	.....	.....	.....	.....	.....	.....	—1	.....
49	57	54	52	54	56	56	<i>f</i> 30	<i>f</i> 3
52	59	54	43	45	52	50	13	2
.....	.....	1	2	2	.....	.....	.....	.....
52	59	55	45	47	52	50	<i>f</i> 19	<i>f</i> 2
20	20	20	18	18	26	24	3	.....
.....	2	2	2	2	2	2	.....	.....
20	22	22	20	20	28	26	<i>f</i> 14	<i>f</i> 1

f Increase for 10 years.

Faculties of higher institutions 1893-1903, the

	1893	1894	1895	1896
Engineering and technology, men.....			72	66
women.....				
total.....	93	72	72	66
Architecture, men.....				
women.....				
total.....				
Art, men.....			d	7
women.....			d	4
total.....	12	14	11	11
Music, men.....			d	53
women.....			d	42
total.....	47	108	86	95
Others, men.....			d	e146
women.....			d	e96
total.....	210	209	172	e242
Special, men.....			d	117
women.....			d	18
total.....	a53	130	140	135
Total, men.....			b2 150	b2 622
women.....			337	401
Grand total.....	b2 212	c2 663	b2 487	b3 023

a Not including Catholic Summer School. b Omitting duplicates. c Including duplicates in Columbia University. d The men and women in art, music, others and special were not classified separately. There was a total of 315 men and 94 women in these four sections.

decade's growth and average annual increase (continued)

1897	1898	1899	1900	1901	1902	1903	INCREASE	
							In eight years	Aver. annual
88 1	96 1	199 1	200 2	206 1	214 1	226 1	154 1	19
89	97	200	202	207	215	227	f 184	f 18
.....	.....	9	6	6	6	15	15	2
.....	.....	9	6	6	6	15	f 15	f 2
6 6	14 9	14 8	31 18	32 21	33 25	32 25	g 25 g 21	g 4 g 3
12	23	22	49	53	58	57	f 45	f 5
38 15	44 12	43 16	54 18	52 28	54 30	56 38	g 3 g -4	g g
53	56	59	72	80	84	94	f 47	f 5
294 100	441 104	410 88	370 91	389 95	429 96	418 101	g 267 g 5	g 38 g
394	545	498	461	484	525	514	f 304	f 30
127 33	144 30	102 26	90 5	123 4	124 2	197 42	g 80 g 24	g 11 g 3
160	174	128	95	127	126	239	f 186	f 19
b2 740 415	b2 738 444	b2 879 427	b2 920 b403	b3 002 b446	b3 070 b476	b3 308 b563	1 158 226	145 28
b3 155	b3 182	b3 306	b3 323	b3 448	b3 546	b3 871	f 1 659	f 166

e Not including the graduate faculties of New York and Cornell Universities. f Increase for 10 years. g Increase for seven years.

Faculties of higher institutions 1893-1903, the

	1893	1894	1895	1896
Engineering and technology, men.....			72	66
women.....				
total.....	93	72	72	66
Architecture, men.....				
women.....				
total.....				
Art, men.....			d	7
women.....			d	4
total.....	12	14	11	11
Music, men.....			d	53
women.....			d	42
total.....	47	103	86	95
Others, men.....			d	e146
women.....			d	e96
total.....	210	209	172	e242
Special, men.....			d	117
women.....			d	18
total.....	a53	130	140	135
Total, men.....			b2 150	b2 622
women.....			337	401
Grand total.....	b2 212	c2 663	b2 487	b3 023

a Not including Catholic Summer School. b Omitting duplicates. c Including duplicates in Columbia University. d The men and women in art, music, others and special were not classified separately. There was a total of 315 men and 94 women in these four sections.

decade's growth and average annual increase (*continued*)

1897	1898	1899	1900	1901	1902	1903	INCREASE	
							In eight years	Aver. annual
88 1	96 1	199 1	200 2	206 1	214 1	228 1	154 1	19
89	97	200	202	207	215	227	<i>f</i> 184	<i>f</i> 18
.....	.....	9	6	6	6	15	15	2
.....	.....	9	6	6	6	15	<i>f</i> 15	<i>f</i> 2
6 6	14 9	14 8	31 18	32 21	33 25	32 25	<i>g</i> 25 <i>g</i> 21	<i>g</i> 4 <i>g</i> 3
12	23	22	49	53	58	57	<i>f</i> 45	<i>f</i> 5
38 15	44 12	43 16	54 18	52 28	54 30	56 88	<i>g</i> 3 <i>g</i> -4	<i>g</i> <i>g</i>
53	56	59	72	80	84	94	<i>f</i> 47	<i>f</i> 5
294 100	441 104	410 88	370 91	389 95	429 96	413 101	<i>g</i> 267 <i>g</i> 5	<i>g</i> 38 <i>g</i>
394	545	498	461	484	525	514	<i>f</i> 304	<i>f</i> 30
127 33	144 30	102 26	90 5	123 4	124 2	197 42	<i>g</i> 80 <i>g</i> 24	<i>g</i> 11 <i>g</i> 3
160	174	128	95	127	126	239	<i>f</i> 186	<i>f</i> 19
<i>b</i> 2 740 415	<i>b</i> 2 738 444	<i>b</i> 2 879 427	<i>b</i> 2 920 <i>b</i> 403	<i>b</i> 3 002 <i>b</i> 446	<i>b</i> 3 070 <i>b</i> 476	<i>b</i> 3 308 <i>b</i> 563	1 158 226	145 28
<i>b</i> 3 155	<i>b</i> 3 182	<i>b</i> 3 306	<i>b</i> 3 323	<i>b</i> 3 448	<i>b</i> 3 546	<i>b</i> 3 871	<i>f</i> 1 659	<i>f</i> 166

e Not including the graduate faculties of New York and Cornell Universities. *f* Increase for 10 years. *g* Increase for seven years.

Students of higher institutions 1893-1903, the

	1893	1894	1895	1896
Colleges for men, men...	2 969	3 324	3 439	3 207
women.....	6	10	10	.....
total.....	2 975	3 334	3 449	3 207
Colleges for women, men.....	2	1	2	1
women.....	2 078	2 116	2 187	2 252
total.....	2 080	2 117	2 189	2 253
Colleges for men and women, men.....	1 877	1 713	1 576	1 489
women.....	761	579	665	669
total.....	2 638	2 292	2 241	2 158
Theology, men.....	588	662	688	813
women.....	8	7	14	8
total.....	591	669	702	821
Law, men.....	a1 400	a1 469	1 572	1 825
women.....	10	17	23	29
total.....	1 470	1 486	1 594	1 854
Education, men.....	114	80	109	150
women.....	517	450	560	719
total.....	631	530	669	869
Medicine, men.....	3 151	3 221	3 564	3 674
women.....	216	199	192	201
total.....	3 367	3 420	3 756	3 875
Dentistry, men.....	327	409	501	519
women.....	1	4	4	6
total.....	328	413	505	525
Pharmacy, men.....	467	433	500	610
women.....	3	4	6	11
total.....	470	437	506	621
Veterinary, men.....	224	232	190	147
women.....	.....	1	.....	.....
total.....	224	233	190	147
Eye and ear, men.....	7	20	8	7
women.....	2	1	.....	3
total.....	9	21	8	10

a Including summer students.

decade's growth and average annual increase

1897	1898	1899	1900	1901	1902	1903	INCREASE	
							Decade	Aver. an.
3 257	3 367	3 513	3 558	3 371	3 228	3 198	229 —6	23
3 257	3 367	3 513	3 558	3 371	3 228	3 198	223	22
2	2	2	.....	.....	.....	.....	—2	.....
2 217	2 703	2 842	3 065	3 282	3 437	3 921	1 843	184
2 219	2 705	2 844	3 065	3 282	3 437	3 921	1 841	184
1 584	1 667	973	990	1 321	1 482	1 385	—492	—49
824	981	979	744	859	1 013	1 103	342	34
2 408	2 648	1 952	1 734	2 180	2 495	2 488	—150	—15
757	814	787	955	927	964	947	859	36
15	6	6	7	8	17	22	19	2
772	820	798	962	985	981	969	378	88
1 990	2 180	2 151	2 227	2 316	2 338	2 563	1 108	110
42	38	48	41	51	53	55	45	5
2 041	2 218	2 194	2 268	2 367	2 391	2 618	1 148	115
198	231	278	224	270	630	755	641	64
913	1 026	1 890	1 548	1 622	1 682	1 887	1 370	137
1 111	1 257	2 168	1 772	1 892	2 312	2 642	2 011	201
3 790	3 376	3 129	3 262	3 270	3 580	3 568	417	42
235	206	206	187	158	164	154	—62	—6
4 025	3 582	3 335	3 449	3 428	3 744	3 722	355	36
499	426	487	546	685	678	867	540	54
12	12	11	10	20	21	36	35	4
511	488	498	556	705	699	903	575	58
623	610	531	623	681	678	639	172	17
21	25	25	25	36	35	30	27	3
644	635	556	648	717	713	669	199	20
119	95	82	76	99	200	251	27	3
.....	1	1	.....	.....	.....	.....	.....	.....
119	96	83	76	99	200	251	27	3
2	11	3	3	3	1	6	—1	.....
.....	.....	1	.....	.....	.....	1	—1	.....
2	11	4	3	3	1	7	—2	.....

Students of higher institutions 1893-1903, the decade's

	1893	1894	1895	1896
Engineering and technology, men.....	553	565	572	509
women				
total	553	565	572	509
Architecture, men.....				
women				
total				
Art, men.....				
women	308	265	270	280
total.....	308	265	270	280
Music, men.....	54	208	2134	172
women.....	198	972	7808	866
total	252	1 180	1 032	1 038
Others, men.....	1 352	1 348	1 491	1 547
women.....	2 742	2 118	2 151	2 015
total	4 094	3 466	3 642	3 562
Special, men.....	c2 173	c2 980	3 833	3 470
women	c121	c835	1 949	1 638
total.....	c2 294	c3 815	5 782	5 108
Total, men	b15 107	b16 898	b17 808	b17 623
women	6 966	7 578	8 928	8 607
grand total	b21 833	b23 976	b26 731	b26 320

b Omitting duplicates.

c Not including students attending the lectures at Catholic Summer School.

growth and average annual increase (continued)

1897	1898	1899	1900	1901	1902	1903	INCREASE	
							Decade	Aver. an.
549	606	1 325	1 501	1 781	2 043	2 447	1 894	189
.....	108	12	58	6	8	14	14	1
549	714	1 337	1 559	1 787	2 051	2 461	1 908	191
.....	.....	42	40	49	48	135	135	14
.....	.....	6	3	3	2	1	1	.....
.....	.....	48	43	52	50	136	136	14
.....	.....	.....	108	136	151	167	167	17
236	582	601	973	1 038	1 186	1 106	798	80
236	582	601	1 081	1 174	1 337	1 273	965	97
155	190	197	197	206	226	245	191	19
515	576	555	872	924	876	942	744	74
670	766	752	1 069	1 130	1 102	1 187	935	94
1 896	1 507	1 605	1 587	1 940	2 186	2 327	975	98
2 102	1 732	1 876	1 617	2 132	2 124	2 405	-837	-34
3 998	3 239	3 481	3 204	4 072	4 310	4 732	878	88
4 055	4 732	4 703	3 919	4 230	4 832	5 846	3 673	367
1 976	1 991	2 639	915	1 087	995	3 229	3 108	311
6 031	6 723	7 342	4 834	5 317	5 827	9 075	6 781	678
b18 899	19 814	b19 799	e19 798	f21 268	b23 970	b25 029	9 922	992
9 108	9 987	b11 691	e10 062	f11 215	b11 394	b14 689	7 723	772
b28 007	29 801	b231 490	b29 795	b32 203	b34 364	b39 718	17 885	1 789

d Not including 2232 students of Chautauqua Summer School.

e Omitting all duplicates except 65 in Syracuse which were not reported separately as men and women. These are, however, omitted in the total.

f Omitting all duplicates except 60 in Syracuse and 220 in Columbia which were not reported separately as men and women.

Net property of higher institutions 1893-1903, the decade's growth and average annual increase

	1893	1894	1895	1896	1897	1898	1899
Colleges for men.....	\$24 669 489 58	\$23 267 684 27	\$24 303 303 84	\$25 954 326 39	\$28 324 625 00	\$29 826 442 44	\$29 760 994 70
Colleges for women.....	3 935 578 58	3 908 484 52	4 088 474 42	4 225 598 89	4 523 378 56	4 887 495 26	5 391 555 26
Colleges for men and women.....	12 070 284 20	11 755 423 05	12 048 958 55	12 284 593 82	12 484 088 43	13 063 901 19	13 355 087 07
Theology.....	5 490 085 42	5 431 832 48	6 583 664 15	7 217 430 09	7 428 076 35	7 488 856 75	7 874 919 45
Law.....	52 459 11	492 638 44	393 422 32	827 508 89	831 581 82	928 184 83	946 088 18
Education.....	757 251 83	868 352 52	974 563 98	1 492 059 94	1 532 524 65	1 571 775 32	1 751 199 89
Medicine.....	1 795 655 57	3 557 431 74	3 872 306 87	3 778 142 41	3 965 024 66	3 823 273 66	5 184 200 44
Dentistry.....	6 995 62	31 933	28 427 29	58 036 93	72 577 90	77 014 31	79 212 93
Pharmacy.....	114 816 10	120 085 50	132 932 75	132 482 23	135 753 82	138 568 50	144 248 77
Veterinary.....	750	750	900	900	178 222 68	175 696 53	180 102 76
Eye and ear.....	200 250	200 250	200 250	100 504 14	100 511 27	100 500	100 500
Engineering and technology.....	337 677 12	1 400 055 66	1 420 832 78	1 429 428 67	1 885 524 85	778 542 93	891 057 47
Architecture.....	.....	.....	.....	.....	.....	.....	.....
Art.....	.....	.....	.....	.....	.....	.....	.....
Music.....	3 400 83	62 853 10	64 506	47 862 54	58 109 05	152 258 65	152 855 81
Others.....	3 917 947 88	3 973 968 97	4 116 443 71	4 073 856 01	4 108 935 08	64 308 33	63 484 40
Special.....	1 636 115 66	2 109 592 14	2 826 582 24	2 847 494 60	2 873 273 06	4 211 841 12	4 253 244 86
Total.....	\$54 988 752 50	\$57 241 835 39	\$60 605 628 80	\$64 420 225 55	\$68 578 207 27	\$70 251 067 32	\$73 050 218

a Omitting amount duplicated.

Net property of higher institutions 1893-1903, the decade's growth and average annual increase (continued)

	1900	1901	1902	1903	INCREASE	
					Decade	Average annual
Colleges for men.....	\$31 186 498 41	\$30 377 222 38	\$30 220 592 35	\$31 550 309	\$6 880 819 42	\$688 081 94
Colleges for women.....	5 550 907 36	5 709 919 42	6 188 655 08	6 275 621 54	2 340 047 96	234 004 80
Colleges for men and women.....	13 612 432 87	14 514 844 86	15 929 730 08	16 502 190 80	4 431 906 60	443 190 66
Theology	10 046 446 40	10 352 127 74	10 633 233 09	11 271 627 12	5 781 541 70	578 154 17
Law	996 745 97	1 009 156 84	1 031 079 75	979 037 76	926 578 65	92 657 87
Education	2 223 137 84	2 268 579 66	2 529 646 53	2 587 085 12	1 829 833 29	182 983 33
Medicine	5 044 511 74	5 139 451 60	5 287 721 40	5 813 452 56	4 017 796 99	401 779 70
Dentistry	82 013 78	87 798 48	92 872 69	124 467 93	117 472 31	11 747 23
Pharmacy	150 146 18	156 469 82	160 831 83	202 092 44	87 276 34	8 727 63
Veterinary	172 971 01	176 716 93	158 191 46	158 191 46	157 441 46	15 744 15
Eye and ear.....	100 609 12	100 609 12	104 118 05	100 000	—100 350	—10 025
Engineering and technology.....	840 538 66	936 325 76	1 186 408 46	1 383 156 56	1 045 479 44	104 547 94
Architecture	152 355 81	152 355 81	152 355 81	29 540 11	29 540 11	2 954 01
Art	69 917 23	69 641 73	68 953	69 129 18	65 728 35	6 572 84
Music.....	4 388 409 72	4 434 589 89	4 642 660 48	4 636 841 83	768 893 95	76 889 40
Others	3 284 637 17	3 392 984 61	4 548 925 47	4 643 048 89	3 006 633 23	300 693 32
Special						
Total	\$77 902 339 27	^a \$78 874 833 30	^a \$82 931 575 53	^a \$86 375 792 30	\$31 387 039 80	\$3 138 703 98

^a Omitting amount duplicated.

7 RECEIPTS OF HIGHER INSTITUTIONS 1893-1903, THE DECADE'S GROWTH AND AVERAGE ANNUAL INCREASE

	1893	1894	1895	1896	1897	1898	1899
Colleges for men	\$2 091 017	\$1 812 619	\$2 459 001	\$2 768 473	\$2 169 054	\$5 150 106	\$6 791 018
Colleges for women.....	638 962	515 506	720 660	710 568	692 810	838 862	914 800
Colleges for men and women	693 090	931 450	738 738	695 608	885 960	1 016 640	994 036
Theology.....	613 383	353 864	270 770	355 261	428 519	654 606	495 509
Law	87 785	124 857	134 057	165 945	187 152	225 779	221 910
Education.....	99 527	108 182	145 955	186 087	203 566	239 767	249 280
Medicine.....	262 129	550 502	460 044	519 147	494 945	469 981	488 795
Dentistry	34 268	51 252	67 142	70 489	76 865	68 450	76 885
Pharmacy	97 693	128 232	108 895	93 399	87 575	87 431	81 478
Veterinary.....	14 120	15 565	17 990	14 485	41 906	36 704	34 009
Eye and ear.....	735	1 340	1 075	1 700	450	1 175	938
Engineering and technology.....	50 747	109 460	106 898	104 576	132 007	60 897	79 222
Architecture.....	.....	.....	.....	.....	.....	.....	.....
Art .....	.....	.....	.....	.....	.....	.....	.....
Music.....	10 019	65 483	67 282	85 995	84 962	17 517	12 350
Others.....	255 779	242 151	260 500	232 741	235 700	380 163	87 642
Special.....	121 983	124 277	343 985	169 237	210 165	203 726	206 508
Total	\$5 061 306	\$5 134 680	\$5 902 933	\$6 123 655	\$5 881 636	\$9 328 089	\$10 881 234

aStatistics not reported separately, included under liberal arts department.

7 RECEIPTS OF HIGHER INSTITUTIONS 1893-1903, THE DECADE'S GROWTH AND AVERAGE ANNUAL INCREASE (continued)

	1900	1901	1902	1903	INCREASE	
					Decade	Average annual
Colleges for men.....	\$3 965 360	\$3 082 154	\$3 096 764	\$3 614 893	\$1 523 876	\$152 388
Colleges for women.....	853 479	1 022 182	1 394 718	1 895 204	1 266 242	126 624
Colleges for men and women.....	1 190 632	1 346 056	2 248 827	2 006 531	1 313 441	131 844
Theology.....	745 725	895 700	880 103	896 571	283 188	28 319
Law.....	224 045	229 785	245 364	254 432	166 647	16 665
Education.....	255 666	283 250	320 065	307 361	707 834	70 783
Medicine.....	388 896	417 268	515 544	520 065	257 936	25 794
Dentistry.....	81 073	97 585	114 382	145 364	111 096	11 110
Pharmacy.....	71 833	72 068	66 960	81 562	-16 131	-1 613
Veterinary.....	31 103	33 350	35 137	34 679	20 559	2 056
Eye and ear.....	1 156	1 156	355	890	95	10
Engineering and technology.....	88 424	116 921	123 317	156 357	105 610	10 561
aArchitecture.....	.....	.....	.....	.....	.....	.....
Art.....	12 350	12 350	12 350	15 123	15 123	1 512
Music.....	33 041	38 420	38 194	39 690	29 671	2 967
Others.....	251 519	293 685	315 189	305 823	50 043	5 004
Special.....	186 980	265 218	292 938	302 047	180 054	18 005
Total.....	\$8 381 283	\$8 207 148	\$9 700 239	\$11 076 594	\$6 015 288	\$601 529

aStatistics not reported separately. Included under liberal arts department.

EXPENDITURES OF HIGHER INSTITUTIONS 1893-1903, THE DECADE'S GROWTH AND AVERAGE ANNUAL INCREASE

	1893	1894	1895	1896	1897	1898	1899
Colleges for men.....	\$1 831 634	\$1 358 184	\$1 940 967	\$2 091 207	\$2 163 294	\$4 066 928	\$5 968 184
Colleges for women.....	647 828	524 784	491 709	568 580	976 061	817 150	905 617
Colleges for men and women.....	677 582	831 829	682 115	716 304	756 817	814 238	960 206
Theology.....	321 862	333 548	255 153	376 486	327 294	360 830	363 631
Law.....	82 882	145 943	107 290	187 187	190 373	227 175	238 014
Education.....	98 791	105 645	143 314	182 003	195 303	232 080	249 100
Medicine.....	616 481	443 595	697 653	744 012	815 631	480 893	482 067
Dentistry.....	36 140	50 641	67 130	61 734	72 463	65 865	73 531
Pharmacy.....	97 242	127 126	106 732	90 702	79 986	91 559	78 923
Veterinary.....	14 120	14 065	17 990	14 485	40 510	36 774	85 696
Eye and ear.....	795	1 340	1 026	1 744	439	1 354	947
Engineering and technology.....	51 995	274 464	254 848	152 189	162 643	654 468	654 897
Architecture.....	.....	.....	.....	.....	.....	.....	.....
Art.....	10 766	18 665	12 989	11 556	9 611	27 098	21 653
Music.....	9 708	63 802	66 191	35 093	34 013	38 215	36 823
Others.....	230 747	214 040	227 420	240 767	221 419	206 833	210 665
Special.....	65 405	86 053	372 745	171 793	230 489	216 892	224 252
Total.....	\$4 792 987	\$4 627 023	\$5 555 272	\$5 665 798	\$5 771 326	\$7 738 388	\$9 848 431

^aStatistics not reported separately. Included under liberal arts department.

^bNot including \$2,013,975 for improvements at Columbia's new site.

^cNot including Columbia faculty of applied science which was not reported separately this year. ^dOmitting amount duplicated.

EXPENDITURES OF HIGHER INSTITUTIONS 1893-1903, THE DECADE'S GROWTH AND AVERAGE ANNUAL INCREASE (continued)

	1900	1901	1902	1903	INCREASE	
					Decade	Average annual
Colleges for men.....	\$3 679 523	\$2 870 718	\$2 997 368	\$3 278 856	\$1 442 222	\$144 222
Colleges for women.....	822 650	988 478	1 296 007	1 780 913	1 133 585	113 359
Colleges for men and women.....	990 940	1 097 734	1 670 976	1 657 579	980 047	98 006
Theology.....	621 844	881 212	791 889	811 300	489 438	48 944
Law.....	233 259	236 945	236 946	251 441	109 059	16 906
Education.....	255 029	282 100	317 146	788 022	689 231	68 923
Medicine.....	406 678	415 090	502 252	403 810	—122 671	—12 267
Dentistry.....	76 975	91 212	109 052	133 475	97 335	9 734
Pharmacy.....	66 557	66 719	56 637	100 494	3 252	325
Veterinary.....	30 871	41 831	33 155	32 997	18 877	1 888
Eye and ear.....	987	987	355	890	95	10
Engineering and technology.....	53 224	109 251	106 252	128 353	76 358	7 636
Architecture.....	.....	.....	.....	.....	.....	.....
Art.....	30 923	21 256	22 954	25 010	14 244	1 424
Music.....	32 214	87 519	37 301	88 726	28 958	2 896
Others.....	208 368	257 968	274 917	298 718	62 971	6 297
Special.....	163 995	218 743	255 498	250 686	185 281	18 528
Total.....	\$7 663 037	\$6 576 265	\$6 708 698	\$10 061 269	\$5 268 282	\$526 828

aStatistics not reported separately, included under liberal arts department. bOmitting amount duplicated.

8 HIGHER INSTITUTIONS

CLASSIFICATION	NUMBER	FACULTY		STUDENTS	
	1903	Men	Women	Men	Women
Colleges for men.....	21	598	3	3 198	.....
Colleges for women.....	5	113	186	.....	3 921
Colleges for men and women....	7	249	43	1 385	1 103
Graduate departments.....	5	267	.....	717	265
Total.....	38	1 226	232	5 300	5 289
Theology.....	16	173	3	947	22
Law.....	8	133	1	2 563	55
Education.....	3	72	85	755	1 887
Medicine.....	13	1 147	82	3 568	154
Dentistry.....	3	114	1	867	36
Pharmacy.....	5	56	.....	639	30
Veterinary.....	2	50	.....	251	.....
Eye and ear.....	1	24	2	6	1
Library.....	1	13	28	15	61
Commerce, accounts and finance	1	13	.....	133	.....
Total.....	53	1 795	152	9 744	2 246
Engineering and technology....	7	226	1	2 447	14
Architecture.....	2	15	.....	185	1
Art.....	3	32	25	167	1 106
Music.....	4	56	38	245	942
Other.....	4	120	73	1 462	2 079
Total.....	20	449	137	4 456	4 142
Special.....	7	197	42	5 846	3 229
Grand total.....	118	3 308	563	25 029	14 689

GROUPED IN FOUR CLASSES

	FIRST DE- GREES CON- FERRED ON EXAM.	NET PROPERTY	EXPENDITURES	RECEIPTS
Total	1903	1903	1903	1903
3 198	580	\$31 550 809 ..	\$3 273 855 85	\$3 614 892 99
3 921	781	6 275 621 54	1 780 912 80	1 895 208 85
2 488	376	16 502 190 80	1 657 579 25	2 006 530 64
982	283	44 000 ..	8 336 27	8 336 27
10 589	2 020	\$54 372 121 34	\$6 720 684 17	\$7 524 963 75
969	33	\$11 271 627 12	\$311 300 09	\$896 571 34
2 618	521	979 037 76	251 440 61	254 432 16
2 642	117	2 587 085 12	788 022 13	807 361 49
3 722	513	5 818 452 56	493 810 12	520 064 98
903	124	124 467 93	133 474 70	145 304 17
669	212	202 092 44	100 493 53	81 562 28
251	24	158 191 46	32 997 03	34 679 48
7	3	100 000 ..	890 ..	890 ..
76	8	779 037 04	3 129 54	3 214 68
133	23	.....	10 281 ..	10 281 ..
11 990	1 573	\$22 015 041 48	\$2 625 838 75	\$2 754 421 58
2 461	360	\$1 383 156 56	\$128 352 58	\$156 356 82
186	13	.....	.....	.....
1 273	11	29 540 11	25 010 23	15 123 44
1 187	3	69 129 18	38 726 12	39 690 30
3 541	10	3 863 754 79	271 971 44	283 990 45
8 598	397	\$5 345 580 64	\$464 060 37	\$495 161 01
9 075	51	\$4 643 048 89	\$250 685 96	\$302 047 36
39 718	4 041	\$86 375 792 30	\$10 061 269 25	\$11 076 593 70

9 INSTITUTIONS

Table 1 appears in full
Figures in curves show the rank

OFFICERS OF INSTRUCTION	STUDENTS
1 (1, 1, 1) Columbia .....a527	1 Columbia.....ab5 122
2 (2, 2, 2) Cornell 394	2 Cornell b3 146
3 (4, 3, 3) New York 197	3 Syracuse b1 992
4 (3, 4, 4) Syracuse 181	4 New York..... b1 965
5 (5, 6, 6) Buffalo 159	5 Buffalo 685
6 (6, 5, 5) Union 96	6 Union 569

Institutions in Table 2 exclud-

Table 2 appears in full

1 (3, 4, 3) Col. City of N. Y. 115	1 Nor. Col. City of N. Y. 2 295
2 (1, 12, 7) Nor. Col. City of N. Y. 93	2 Vassar. 864
3 (2, 1, 2) Vassar 93	3 Col. City of N. Y. 819
4 (4, 2, 1) Barnard 57	4 Barnard 445
5 (19, 13, 10) Robert 37	5 Rochester 245
6 (6, 23, 4) Adelphi 33	6 Adelphi 228
7 (16, 8, 5) St John's, Fordham.. 32	7 Elmira 201
8 (14, 15, 9) Wells..... 32	8 Hamilton 191
9 (21, 11, 13) Manhattan..... 31	9 Colgate 182
10 (27, 14, 20) Canisius 29	10 St Lawrence..... 158
11 (24, 24, 11) Mackenzie..... 29	11 Col. of St Francis Xav.. 129
12 (25, 27, 15) St Francis..... 27	12 Alfred 123
13 (11, 10, 14) Col. of St Francis Xav. 23	13 Syrian 121
14 (7, 22, 19) Elmira 23	14 Wells 116
15 (5, 5, 12) Rochester 21	15 St Bonaventure's 111
16 (9, 3, 6) Colgate 20	16 St John's, Fordham.... 110
17 (18, 9, 18) Hobart 20	17 Polytechnic, B'klyn.... 108
18 (17, 20, 8) Polytechnic, B'klyn.. 20	18 Hobart 105
19 (12, 16, 17) Alfred 19	19 Robert 104
20 (8, 6, 16) Hamilton 19	20 Niagara 77
21 (15, 21, 23) St Bonaventure's.... 18	21 Manhattan 69
22 (22, 26, 28) St John's, B'klyn.... 18	22 St John's, B'klyn 54
23 (13, 7, 25) Syrian 13	23 St Stephen's 44
24 (20, 25, 24) Niagara 12	24 Mackenzie..... 38
25 (10, 19, 21) St Lawrence 12	25 St Francis 36
26 (26, 17, 26) Keuka 10	26 Keuka..... 35
27 (23, 18, 22) St Stephen's..... 8	27 Canisius, 32
28 (28, 28, 27) Canton Christian.... —	28 Canton Christian —

aIncluding statistics of Barnard and Teachers colleges. bNot including those taking summer courses only.

IN TABLE 1

in the bound report.

in the other three columns.

NET PROPERTY		ANNUAL EXPENDITURES EXCLUDING GROUNDS AND BUILDINGS	
1 Columbia.....	<i>a</i> \$23 221 073 10	1 Columbia	<i>a</i> <i>f</i> \$3 553 649 54
2 Cornell	12 791 556 32	2 Cornell	<i>f</i> 920 450 84
3 New York.....	3 506 740 34	3 New York.....	423 078 58
4 Syracuse.....	3 135 710 18	4 Syracuse.....	293 161 57
5 Union	1 236 128 72	5 Union	<i>f</i> 136 648 55
6 Buffalo.....	245 095 71	6 Buffalo.....	81 528 99

ing those given in Table 1

in the bound report.

1 Vassar.....	\$2 644 732 22	1 Barnard.....	\$1 188 486 84
2 Barnard.....	2 387 637 93	2 Vassar.....	369 773 94
3 Colgate.....	<i>c</i> 2 158 499 64	3 Col. City of N. Y....	815 072 50
4 Col. City of N. Y....	1 655 300 ..	4 Adelphi.....	211 030 78
5 Rochester.....	1 348 208 38	5 St John's, Fordham..	121 357 34
6 Hamilton.....	1 167 328 ..	6 Colgate.....	70 285 36
7 Syrian.....	<i>d</i> 1 101 739 06	7 Nor. Col. City of N. Y.	67 906 65
8 St John's, Fordham..	1 013 621 67	8 Polytechnic, B'klyn.	65 851 93
9 Hobart.....	793 583 66	9 Wells.....	63 885 62
10 Col. St Francis Xav.	737 786 60	10 Robert.....	63 704 19
11 Manhattan.....	698 595 53	11 Mackenzie.....	<i>c</i> 62 337 04
12 Nor. Col. City of N. Y.	533 333 32	12 Rochester.....	61 361 88
13 Robert.....	528 658 21	13 Manhattan.....	55 044 51
14 Canisius.....	464 304 56	14 Col. St Francis Xav.	47 461 96
15 Wells.....	449 168 07	15 St Francis.....	46 331 45
16 Alfred.....	396 279 81	16 Hamilton.....	45 908 ..
17 Keuka.....	<i>e</i> 346 366 08	17 Alfred.....	39 190 37
18 St Stephen's.....	341 039 27	18 Hobart.....	38 549 56
19 St Lawrence.....	331 609 99	19 Elmira.....	31 151 76
20 Polytechnic, B'klyn.	329 092 53	20 Canisius.....	27 478 88
21 St Bonaventure's....	267 300 ..	21 St Lawrence.....	22 690 81
22 Elmira.....	260 750 ..	22 St Stephen's.....	22 599 65
23 Adelphi.....	228 596 87	23 St Bonaventure's...	17 300 ..
24 Mackenzie.....	217 308 42	24 Niagara.....	12 910 ..
25 Niagara.....	216 530 ..	25 Syrian.....	12 460 53
26 St John's, B'klyn...	170 000 ..	26 Keuka.....	10 544 42
27 St Francis.....	164 087 72	27 Canton Christian...	9 854 10
28 Canton Christian...	124 403 11	28 St John's, B'klyn...	9 389 28

*c*Including theological department. *d*Including medical, pharmaceutical and preparatory departments. *e*Including academic department. *f*Expenditures on grounds and buildings not being reported, the whole amount expended for improvement and repairs is deducted.

Institutions in Table 3

Table 3 appears in full
Figures in curves show the rank

OFFICERS OF INSTRUCTION		STUDENTS	
1 (8, 19, 18) N. Y. Postgrad. Med. S.	233	1 Cooper Union, night sch.	3 441
2 (11, 41, 22) N. Y. Po'cl. Med. S. & H.	a128	2 Pratt Inst.	3 210
3 (4, 5, 1) Teachers College	128	3 Chautauqua Inst.	a2 847
4 (2, 2, 3) Pratt Inst.	124	4 Teachers College	1 915
5 (3, 46, 50) Chautauqua Inst.	a102	5 Catholic Summer Sch.	b1 517
6 (17, 16, 12) Long Island Col. Hosp.	72	6 N. Y. Trade School	924
7 (29, 11, 23) N. Y. Hom. Med. C. & H.	67	7 N. Y. Law School	d332
8 (1, 3, 5) Cooper Union, n. sch.	48	8 N. Y. Postgrad. Med. S.	639
9 (10, 27, 7) N. Y. Col. of Dentistry	42	9 N. Y. Col. of Music	538
10 (33, 10, 43) N. Y. State Library Sch.	41	10 N. Y. Col. of Dentistry	488
11 (41, 29, 42) N. Y. Med. Col. & Hosp.	40	11 N. Y. Polyclin. Med. S. & H.	a416
12 (12, 49, 51) Metropolit'n C. of Music	36	12 Metropolitan Col. of Music	401
13 (9, 31, 19) N. Y. Col. of Music	35	13 N. Y. State Nor. Col.	387
14 (23, 42, 24) N. Y. Dental School	35	14 Col. of Ph. of City of N. Y.	325
15 (30, 32, 28) Eclectic Med. Col.	34	15 Cooper U., Woman's Art S.	c318
16 (5, 28, 20) Catholic Summer Sch.	b32	16 Rensselaer Poly. Inst.	314
17 (16, 12, 8) Rensselaer Poly. Inst.	32	17 Long Island Col. Hosp.	266
18 (6, 9, 13) N. Y. Trade School	30	18 Grand Conserv. of Music	248
19 (48, 25, 46) N. Y. Ophthalmic Hosp.	26	19 N. Y. Sch. of App. Design	248
20 (18, 43, 34) Grand Con. of Music	23	20 Hebrew Technical Inst.	239
21 (32, 7, 14) Rochester Theol. Sem.	23	21 St Joseph's Sem.	155
22 (13, 17, 16) N. Y. State Nor. Col.	22	22 Brooklyn Col. of Phar.	152
23 (26, 4, 2) Union Theol. Sem.	18	23 N. Y. Dental School	137
24 (44, 34, 41) Alfred Theol. Sem.	17	24 St Bernard's Sem.	137
25 (7, 24, 6) N. Y. Law School	17	25 General Theol. Sem.	127
26 (25, 1, 4) General Theol. Sem.	15	26 Union Theol. Sem.	121
27 (22, 33, 30) Brooklyn Col. of Phar.	14	27 Syrian Prot. Col., med. d.	115
28 (39, 48, 26) Hamilton Theol. Sem.	14	28 Brooklyn Law Sch.	112
29 (19, 36, 37) N. Y. Sch. of Ap. Design	14	29 N. Y. Hom. Med. Col. & H.	105
30 (28, 45, 35) Brooklyn Law Sch.	13	30 Eclectic Med. Col.	104
31 (14, 23, 15) C. of Ph. of City of N. Y.	13	31 C'rad Poppenhusen Ass'n	95
32 (24, 15, 17) St Bernard's Sem.	13	32 Rochester Theol. Sem.	93
33 (21, 6, 10) St Joseph's Sem.	13	33 N. Y. State Library Sch.	d76
34 (47, 40, 49) Am. Inst. of Phrenology	11	34 T. S. Clarkson M. S. of T.	72
35 (35, 8, 9) Auburn Theol. Sem.	11	35 Auburn Theol. Sem.	59
36 (15, 47, 32) Cooper U., Wo'n's Art S.	e11	36 St Bonav. Col., theol. dep.	45
37 (20, 20, 11) Hebrew Technical Inst.	11	37 St John's Col., theol. dep't	45
38 (43, 38, 38) N. Y. S. S. of Clay-work	10	38 Sem. of Our Lady of Ang.	44
39 (34, 14, 25) T. S. Clarkson M. S. of T.	10	39 Hamilton Theol. Sem.	37
40 (36, 35, 37) St Bonav. Col., theol. d.	9	40 Jewish Theol. Sem.	36

a Taken from 1902 report, no figures being reported this year. b Taken from 1902 report, as the report for this year was received too late for insertion in these tables. c Including statistics for the schools of stenography and typewriting and telegraphy. d Not including those taking summer course only.

excluding those in Table 1

in the bound report.

in the other three columns.

NET PROPERTY		EXPENDITURES EXCLUDING GROUNDS AND BUILDINGS	
1 General Theol. Sem....	\$3 916 133 23	1 Teachers College	\$465 289 99
2 Pratt Inst	23 678 170 26	2 Union Theol. Sem.....	289 916 45
3 Cooper U., night sch....	f3 232 895 32	3 Pratt Institute.....	253 768 10
4 Union Theol. Sem.....	2 436 895 09	4 General Theol. Sem ...	132 668 52
5 Teachers College.....	2 148 071 12	5 Cooper U., night sch ..	77 576 75
6 St Joseph's Sem.....	1 223 298 27	6 N. Y. Law School	67 430 72
7 Rochester Theol. Sem ..	1 121 632 92	7 N. Y. Col. of Dentistry	65 946 35
8 Auburn Theol. Sch. ...	985 681 31	8 Rensselaer Pol'tec. Inst.	59 086 07
9 N. Y. Trade Sch.....	912 312 11	9 Auburn Theol. Sem ...	57 622 78
10 N. Y. State Library Sch.	g779 087 04	10 St Joseph's Sem.....	54 854 41
11 N. Y. Hom. Med. C. & H.	h690 831 85	11 Hebrew Tech. Inst....	46 340 75
12 Rensselaer Poly. Inst....	520 000 05	12 Long Island Col. Hosp.	45 778 88
13 Jewish Theol. Sem.....	478 139 47	13 N. Y. Trade School....	44 939 97
14 T. S. Clarkson M. S. of T.	462 055 86	14 Rochester Theol. Sem.	43 711 74
15 St Bernard's Sem.....	440 481 47	15 C. of Ph. of City of N. Y	41 298 41
16 Long Island Col. Hosp..	h254 960 90	16 N. Y. State Nor. Col. ...	39 315 29
17 N. Y. State Nor. Col. ...	250 965 11	17 St Bernard's Sem.....	38 083 05
18 Canton Theol. Sch.	246 732 72	18 N. Y. Postg. M. S. & H.	36 248 35
19 N. Y. Postgrad. Med. S.	232 664 16	19 N. Y. Col. of Music....	29 687 ..
20 Hebrew Tech. Inst	209 450 98	20 Catholic Summer Sch.	b27 326 66
21 C. Poppenhusen Ass'n..	195 151 56	21 Jewish Theol. Sem....	25 312 53
22 St John's Col., theol. d..	153 000 ..	22 N. Y. Poly. M. S. & H.	a23 504 68
23 C. of Ph. of City of N. Y.	144 410 24	23 N. Y. Hom. M. C. & H.	20 956 62
24 N. Y. Law School	138 348 79	24 N. Y. Dental School...	17 470 23
25 N. Y. Ophthalmic Hosp.	i100 000 ..	25 T. S. Clarkson M. S. of T.	17 008 84
26 Christian Biblical Inst.	92 363 65	26 Hamilton Theol. Sem. .	16 442 34
27 N. Y. Col. of Dentistry.	86 907 12	27 N. Y. S. of App. Design	14 303 31
28 Catholic Summer Sch. .	b82 538 92	28 Eclectic Med. Col. ...	12 968 ..
29 N. Y. Med. Col. & Hosp.	h75 819 02	29 Syrian Prot. C., med. d.	12 612 87
30 Sem. of Our Lady of Ang.	72 190 ..	30 Brooklyn Col. of Phar.	12 565 ..
31 N. Y. Col. of Music.....	68 080 ..	31 Canton Theol. School..	12 337 18
32 Eclectic Med. Col	49 677 ..	32 Cooper U., Wo'n's A. S.	c10 659 78
33 Brooklyn Col. of Phar. .	43 000 ..	33 C. Poppenhusen Ass'n.	10 278 28
34 Alfred Theol. Sem	32 416 99	34 Grand Con. of Music..	8 551 32
35 St Bonavent. S., theol. d.	30 400 ..	35 Brooklyn Law School..	8 245 85
36 N. Y. Sch. of App. Design	29 540 11	36 St John's Col., theol. d.	8 150 ..
37 Hartwick Sem., theol. d	27 352 23	37 St Bonav. C., theol. d..	7 800 ..
38 N. Y. S. S. of Clay-work	19 965 ..	38 N. Y. S. S. of Clay-wk.	7 367 85
39 German M. Luther Sem.	14 909 77	39 Sem. of O'r L'dy of Ang.	6 875 ..
40 Am. Inst. of Phrenology	10 700 ..	40 Christian Biblical Inst.	4 717 74

* Including academic department. f Including all property owned by Cooper Union.
 g Including New York State Library which is used by the school and also by all teaching
 institutions in the University. h Including hospital. i Value of hospital and college taken
 from 1901 report.

Institutions in Table 3

OFFICERS OF INSTRUCTION	STUDENTS
41 (37, 22, 36) St John's Col., theol. d.	841 N. Y. Med. Col. & Hosp.. 34
42 (38, 30, 39) Sem. of O'r L'dy of Ang.	842 Syrian Prot. Col., d. of ph. 30
43 (27, 51, 29) Syrian Prot. C., med. d.	843 N. Y. S. Sch. of Clay-work. 26
44 (45, 18, 81) Canton Theol. Sch....	744 Alfred Theol. Sem..... 24
45 (46, 26, 40) Christian Biblical Inst.	745 Canton Theol. Sch..... 23
46 (40, 13, 21) Jewish Theol. S. of Am.	746 Christian Biblical Inst... 15
47 (31, 21, 33) Grad Pop'nhusen Ass'n.	547 Am. Inst. of Phrenology. 13
48 (42, 50, 44) Syrian Prot. C., d. of ph.	548 N. Y. Ophthalmic Hosp.. 7
49 (50, 39, 45) German M. Luther Sem.	449 Hartwick Sem., theol. d. 5
50 (49, 37, 47) Hartwick Sem., th'ol. d.	250 German M. Luther Sem.. 8
51 (51, 44, 48) Amer. Col. of Musicians	.. 51 Amer. Col. of Musicians. ..

excluding those in Table 1 (*continued*)

NET PROPERTY		EXPENDITURES EXCLUDING GROUNDS AND BUILDINGS	
41 N. Y. Po'cl. Med. S. & H.	a\$7 422 20	41 Alfred Theol. Sem.....	\$3 465 49
42 N. Y. Dental School....	3 622 31	42 N. Y. Med. Col. & Hosp.	3 218 98
43 Grand Conserv. of Music	808 18	43 N. Y. State Library S.	3 129 54
44 Amer. Col. of Musicians	241 05	44 Syrian Prot. C., d. of ph.	3 059 11
45 Brooklyn Law Sch	13 ..	45 German M. Luther S..	1 841 07
46 Chautauqua Inst.....	a ..	46 N. Y. Ophthalmic Hosp.	890 ..
47 Cooper U., Woman's A. S.	j ..	47 Hartwick Theol. Sem..	800 ..
48 Hamilton Theol. Sem...	k ..	48 Am. Col. of Musicians.	188 80
49 Metrop. Col. of Music...	l ..	49 Am. In. of Phrenology.	l
50 Syrian Prot. C., d. of ph.	k ..	50 Chautauqua Inst.....	a
51 Syrian Prot. C., med. d.	k ..	51 Metrop. Col. of Music..	l

a Taken from 1902 report, no figures being reported this year. j Given under night school. k No separate statistics reported for this department; given under arts department. l Not reported.

10 GIFTS

The following made up from Appleton's *Annual Cyclopaedia* shows the amount of gifts value for each year

INSTITUTIONS	ELEMENTARY			SECONDARY	
	New York	United States	Total	New York	United States
1902.....	\$1 496 338	\$266 000	\$1 762 338	\$758 334	\$431 480
1901.....	22 000	115 000	137 000	1 094 666	1 322 000
1900.....	30 000	170 000	200 000	539 000	1 185 500
1899.....	5 000	1 555 000	1 560 000	674 250	3 865 167
1898.....	16 500	229 500	246 000	42 500	2 850 250
1897.....	590 000	1 813 250	1 903 250	347 500	253 000
1896.....	80 000	274 800	354 800	133 500	474 166
1895.....	129 333	621 000	750 333	1 125 250	542 000
1894.....	310 000	4 060 000	4 370 000	348 000	218 500
1893.....	10 000	184 000	194 000	332 000	120 000
Total.....	\$2 689 166	\$8 788 050	\$11 477 216	\$5 395 000	\$11 262 063
	7.4 c. ft	24.2 c. ft	31.6 c. ft	14.8 c. ft	31 c. ft

INSTITUTIONS	LAW		MEDICINE			
Year	Total		New York	United States	Total	New York
1902.....	U. S.	\$60 000	\$1 025 000	\$1 201 000	\$2 226 000	\$6 394 629
1901.....			1 314 500	794 000	2 108 500	1 545 000
1900.....	U. S.	25 000	80 000	12 000	92 000	1 062 000
1899.....	{ N. Y.	12 000	154 500	12 000	166 500	1 611 678
	{ U. S.	125 000				
1898.....			1 740 000	115 000	1 855 000	315 000
1897.....	U. S.	115 000	1 000	.....	1 000	1 678 500
1896.....						266 500
1895.....			640 000	105 000	745 000	1 534 200
1894.....	U. S.	25 000	.....	192 666	192 666	1 791 000
1893.....	N. Y.	75 000	12 000	76 000	88 000	1 432 000
Total.....	\$437 000		\$4 967 000	\$2 507 666	\$8 474 666	\$17 630 507
	Total N. Y. \$87 000		13.6 c. ft	6.9 c. ft	20.5 c. ft	48.5 c. ft
	" U. S. \$350 000					
	N. Y. 2 c. ft					
	1.2 c. ft					

AND REQUESTS

and bequests for educational purposes (including hospitals) of \$5000 each and upward in from 1893 to 1902.

Total	COLLEGE			GENERAL
	New York	United States	Total	Total
\$1 189 814	\$9 235 938	\$9 537 175	\$18 773 108	\$21 725 255
2 416 666	17 207 500	39 026 450	56 233 950	58 787 616
1 724 500	3 701 000	12 696 507	16 397 507	18 322 007
4 539 417	3 183 711	25 050 000	28 233 711	34 333 128
2 892 750	2 194 000	8 932 600	11 126 600	14 265 350
600 500	3 260 000	6 324 166	9 584 166	12 087 916
607 666	2 033 500	7 946 791	9 980 291	10 942 257
1 667 250	4 343 255	4 559 000	8 902 255	11 319 838
566 500	5 789 748	3 219 414	9 009 162	13 945 662
452 000	2 946 666	2 501 500	5 448 166	6 094 166
\$16 657 063	\$53 895 313	\$119 793 603	\$173 688 916	\$201 823 195
				556.1 c. ft
45.9 c. ft	148.5 c. ft	330.1 c. ft	N. Y. total 478.6 c. ft	\$61 979 479 170.7 c. ft

HOSPITALS		THEOLOGY			PROFES- SIONAL
United States	Total	New York	United States	Total	Total
\$5 880 500	\$12 275 129	\$2 627 000	\$523 000	\$3 150 000	\$17 711 129
7 530 635	9 075 635	857 000	317 000	674 000	11 858 135
6 720 333	7 782 333	460 000	274 666	734 666	8 633 999
1 483 058	3 094 736	372 000	140 000	512 000	3 910 236
2 990 000	3 305 000	25 000	155 000	180 000	5 340 000
3 252 000	4 930 500	297 000	20 000	317 000	5 363 500
4 576 667	4 843 167	125 000	154 500	279 500	5 122 667
1 235 667	2 819 867	.....	610 000	610 000	4 174 867
1 576 666	3 367 666	605 000	79 000	684 000	4 269 332
1 059 880	2 491 880	5 000	3 005 000	3 010 000	5 664 880
\$36 355 406	\$53 985 913	\$4 873 000	\$5 278 166	\$10 151 166	\$72 048 745
					198.5 c. ft
				N. Y. total	\$27 557 507
100.1 c. ft	148.6 c. ft	13.4 c. ft	14.5 c. ft	27.9 c. ft	75.9 c. ft

GIFTS AND

INSTITUTIONS	TECHNICAL			SPECIAL		
	Year	New York	United States	Total	New York	United States
1902.....		\$1 680 000	\$1 018 000	\$2 698 000	\$2 205 940	\$8 211 922
1901.....		3 141 000	1 645 000	4 786 000	6 651 000	218 000
1900.....		3 175 000	290 000	3 465 000	755 000	831 333
1899.....		2 067 000	2 835 000	4 902 000	880 000	924 850
1898.....		10 000	1 222 000	1 232 000	105 000	6 325 000
1897.....		60 000	795 000	855 000	398 000	12 210 000
1896.....			248 600	248 600	65 000	1 175 770
1895.....		225 000	70 000	295 000	825 500	935 000
1894.....			515 000	515 000	91 000	203 600
1893.....		1 560 000	2 425 000	3 985 000	181 500	2 078 982
Total.....		\$11 918 000	\$11 063 600	\$22 981 600	\$12 157 940	\$38 104 457
		32.8 c. ft	30.4 c. ft	63.3 c. ft	33.5 c. ft	91.2 c. ft

BEQUESTS (concluded)

Total	LIBRARIES			OTHER	GRAND TOTAL
	New York	United States	Total	Total	
\$10 417 862	\$3 530 000	\$468 000	\$3 998 000	\$17 113 862	\$56 550 246
6 869 000	13 063 333	1 233 000	14 296 333	25 951 333	96 597 084
1 586 333	2 103 000	1 220 000	3 323 000	8 374 333	35 330 339
1 804 850	1 449 821	442 667	1 892 488	8 599 338	46 842 702
6 330 000	392 500	627 000	1 019 500	8 581 500	28 186 850
12 608 000	358 000	2 818 000	3 176 000	16 639 000	34 090 416
1 240 770	1 001 000	518 000	1 519 000	3 008 370	19 073 294
1 760 500	695 000	1 999 667	2 694 667	4 750 167	20 244 872
384 600	257 054	3 792 113	4 049 167	4 948 767	23 163 761
2 260 482	220 000	2 937 000	3 157 000	9 402 482	21 161 528
\$45 262 397	\$23 069 708	\$16 055 447	\$39 125 155	\$107 369 152	\$381 241 092
				295.8 c. ft	1050.5 c. ft
124.7 c. ft	63.5 c. ft	44.2 c. ft	N. Y. total 107.8 c. ft	\$47 145 648 129.9 c. ft	\$186 682 634 376.5 c. ft

11 SUMMARIES OF EXAMINATIONS

	1893	1894
Examinations	a7	a6
Answer papers written	8 067	13 968
" accepted	4 965	9 330
" rejected	3 102	4 638
Per cent papers accepted	61.5	66.8
" rejected	38.5	33.2
Law student certificates issued	589	475
" on examination	62	424
" on equivalents	527	51
" on partial equivalents		
Total on all equivalents	527	51
Per cent law student certificates issued on equivalents	89.5	10.7
" on partial equiv.		
" on all equivalents	89.5	10.7
Academic equivalent certificates issued	28	259
" on examination	2	24
" on equivalents	26	235
" on partial equiv.		
Total on all equivalents	26	235
Per cent academic equiv. cert. issued on equivalents	92.9	90.7
" on partial equiv.		
" on all equivalents	92.9	90.7
Medical student certificates issued	785	947
" on examination	137	395
" on equivalents	648	552
" on partial equivalents		
Total on all equivalents	648	552
Per cent medical student cert. issued on equivalents	82.5	58.3
" on partial equiv.		
" on all equivalents	82.5	58.3
Dental student certificates issued		
" on examination		
" on equivalents		
" on partial equivalents		
Total on all equivalents		
Per cent dental student cert. issued on equivalents		
" on partial equiv.		
" on all equivalents		
Veterinary student certificates issued		
" on examination		
" on equivalents		
" on partial equiv.		
Total on all equivalents		
Per cent veterinary student cert. issued on equivalents		
" on partial equiv.		
" on all equiv.		
Total certificates issued	1 402	1 681
" on examination	201	843
" on equivalents	1 201	838
" on partial equivalents		
" on all equivalents	1 201	838
Per cent total certificates issued on examination	14.3	50.1
" on equivalents	85.7	49.9
" on partial equivalents		
" on all equivalents	85.7	49.9

a Law and medical student examination.

AND CERTIFICATES 1893-1903

1895	1896	1897	1898	1899	1900	1901	1902
b5	b4	d4	d4	d4	d4	5	5
16 612	c23 080	c23 694	c23 647	c27 359	c32 758	c43 265	c37 785
1 158	c14 286	c13 110	c14 434	c15 658	c19 903	c24 308	c21 684
5 154	8 789	10 573	9 207	11 588	12 854	18 941	16 101
69	61.5	55.3	61	57.2	60.8	56.2	57.4
31	38.1	44.6	39	42.4	39.2	43.8	42.6
721	817	780	731	878	840	783	867
500	439	381	383	499	467	433	433
221	378	399	348	379	343	293	295
221	378	399	348	379	30	57	89
30.7	46.3	51.2	47.6	43.2	373	350	384
30.7	46.3	51.2	47.6	43.2	40.8	37.4	34
285	285	295	209	223	3.6	7.3	10.3
26	67	28	16	30	44.4	44.7	44.8
259	218	267	193	178	267	271	e277
259	218	267	193	14	22	30	46
90.9	76.5	90.5	92.3	193	210	211	192
90.9	76.5	90.5	92.3	80.2	35	30	39
1 256	1 475	1 072	914	6.3	245	241	231
656	634	399	307	86.5	78.7	77.9	69.3
600	841	673	607	6.3	13.1	11.1	14.1
600	841	673	607	36	91.8	89	83.4
47.8	57	62.8	66.4	620	68	83	100
47.8	57	62.8	66.4	64	719	700	619
17	78	161	108	3.9	63.8	58.8	51.8
10	51	88	45	67.9	6.7	7.9	10
7	27	73	63	154	70.5	66.7	61.8
7	27	73	63	58	197	217	270
41.2	34.6	45.3	58.3	90	85	94	126
41.2	34.6	45.3	58.3	6	98	95	100
6	7	25	14	96	14	28	44
6	7	25	14	112	112	123	144
6	7	25	14	58.4	49.7	43.8	37
6	7	25	14	3.9	7.1	12.9	16.3
6	7	25	14	62.3	56.8	56.7	53.3
6	7	25	14	25	22	26	48
6	7	25	14	14	11	15	28
6	7	25	14	10	10	11	15
6	7	25	14	1	1	.....	5
6	7	25	14	11	11	11	20
6	7	25	14	40	45.5	42.3	31.3
6	7	25	14	4	4.5	.....	10.4
6	7	25	14	44	50	42.3	41.7
2 279	2 655	2 314	1 969	2 192	2 346	2 346	2 464
1 192	1 191	900	753	894	886	921	1 066
1 087	1 464	1 414	1 216	1 241	1 312	1 227	1 121
1 087	1 464	1 414	1 216	57	148	198	277
52.3	44.9	38.9	38.2	1 298	1 460	1 425	1 398
47.7	55.1	61.1	61.8	40.8	37.8	39.3	43.3
47.7	55.1	61.1	61.8	56.6	55.9	52.3	45.5
47.7	55.1	61.1	61.8	2.6	6.3	8.4	11.2
47.7	55.1	61.1	61.8	59.2	62.2	60.7	56.7

b Law, medical and dental student examination. c Including Chautauqua. d Law, medical, dental and veterinary student examination. e Not including 17 issued for 13 counts and seven for 36 counts.

12 EXAMINATIONS AND CERTIFICATES 1903

LAW, MEDICAL, DENTAL AND VETERINARY STUDENTS		1903
Examinations		4
Answer papers written		41 567
" accepted		22 658
" rejected		18 909
Per cent of papers accepted		54.5
" rejected		45.4
Law student certificates issued		839
" on examination		461
" on equivalents		272
" on partial equivalents		106
Per cent law student certificates issued on equivalents		32.4
" on partial equivalents		12.6
Academic equivalent certificates issued		328
" on examination		54
" on equivalents		209
" on partial equivalents		65
Per cent academic equivalent certificates issued on equivalents		63.7
" on partial equiv.		19.8
Medical student certificates issued		972
" on examination		346
" on equivalents		505
" on partial equivalents		121
Per cent medical student certificates issued on equivalents		51.9
" on partial equiv.		12.4
Dental student certificates issued		290
" on examination		134
" on equivalents		82
" on partial equivalents		74
Per cent dental student certificates issued on equivalents		28.2
" on partial equivalents		25.5
Veterinary student certificates issued		46
" on examination		31
" on equivalents		12
" on partial equivalents		3
Per cent veterinary student certificates issued on equivalents		26.08
" on partial equiv.		6.5
Total certificates issued		2 475
" on examination		1 026
" on equivalents		1 080
" on partial equivalents		369
Per cent certificates issued on examination		41.4
" on equivalents		43.6
" on partial equivalents		14.9

13 LAW SCHOOL SUMMARIES 1892-1903

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	Decade
Institutions.....	7	7	7	7	7	7	7	7	7	7	8	1
Officers of instruction.....	71	103	107	131	139	115	120	124	123	120	134	63
Graduate course.....	54	59	76	72	80	83	84	77	59	47	55	1
LL.B. course.....	1 261	1 181	1 237	1 451	1 646	1 744	1 659	1 774	1 904	1 859	2 071	810
Unclassified.....	155	246	281	331	315	391	451	417	404	485	492	337
Total.....	1 470	1 486	1 594	1 854	2 041	2 218	2 194	2 298	2 367	2 391	2 618	1 148
Students holding degrees.....	427	501	575	621	652	714	731	736	c761	760	757	380
LL.B., LL.M. and LL.D. degrees conferred	434	425	398	422	439	546	480	439	515	549	535	121
Library vols.....	43 206	a81 350	c43 512	73 045	76 296	77 856	86 732	92 454	94 296	97 584	100 278	57 070
Total property.....	\$68 363	b4503 158	d4403 422	c3837 805	c3841 532	\$938 136	\$956 038	\$1 008 746	\$1 019 157	\$1 041 080	\$1 140 598	\$1 077 215
Receipts.....	87 785	124 857	c134 057	c165 945	c187 152	225 779	221 910	224 045	229 785	245 364	254 422	166 647
Expenditures.....	82 382	145 943	c167 290	c187 187	c180 373	227 175	238 014	233 259	236 945	236 906	261 441	169 059

^a Columbia reports for law in 1894, 36,000 volumes heretofore reported only in the general library. ^b In 1894 for the first time, the law equipment is brought into this total. ^c Not including one school which did not report. ^d Not including two schools which did not report. ^e Held 781 degrees.

**14 MEDICAL SCHOOLS OF UNITED STATES, CANADA AND CUBA REGISTERED
OR ACCREDITED JULY 1, 1904**

Alphabetically arranged by states and provinces

United States**Alabama****Group 2 For admission to New York medical schools**

Birmingham Medical College—class 1

N. 21st st. Birmingham, Dean B. L. Wyman

Medical department, Alabama University—class 1

St Anthony & State st. Mobile, Dean George A. Ketchum

Arkansas**Group 2 For admission to New York medical schools**

Medical department, Arkansas University—class 1

2d & Sherman st. Little Rock, Sec. F. L. French.

California**Group 1 For admission to New York licensing examination**

California Medical College; eclectic—class 1

1422 Folsom st. San Francisco, Dean D. Maclean

College of Medicine (Univ. of Southern California)—class 1

Buena Vista st. (Ord & Alpine) Los Angeles, Dean H. G.
Brainerd

Hahnemann Med. Coll. of the Pacific; homeopathic—registered

Sacramento & Maple st. San Francisco, Dean James W.
Ward

Medical department, University of California—registered

South of Golden Gate park, San Francisco, Dean A. A.
D'Ancona

Oakland College of Medicine and Surgery—class 3

Grove & 31st st. Oakland, Pres. Joseph L. Milton

Group 2 For admission to New York medical schools

Cooper Medical College—class 1

Sacramento & Webster st. San Francisco, Dean Henry
Gibbons jr

Medical department, Coll. of Physicians & Surgeons—class 1

14th st. (Valencia & Mission) San Francisco, Dean D. A.
Hodghead

Colorado

Group 1 For admission to New York licensing examination

Denver & Gross College of Medicine (Denver Univ.)—registered

Arapahoe & 14th st. Denver, Dean Sherman G. Bonney

Denver College of Medicine, University of Denver—registered

Arapahoe & 14th st. Denver, Sec. Henry Sewall

[See Group 2]

Medical department, University of Colorado—registered

Boulder, Dean Luman M. Giffin

Group 2 For admission to New York medical schools

Denver Homeopathic College—registered

Park av. & Humboldt st. Denver, Dean James P. Willard

Gross Medical College (Rocky Mt University)—class 1

W. 10th av. & S. Water st. Denver, Dean Thomas H. Hawkins

United with Denver College of Medicine, med. department, Denver University 1902 to form Denver and Gross College of Medicine (Denver University).

Connecticut

Group 1 For admission to New York licensing examination

Medical department, Yale University—registered

York st. (Crown & Chapel) New Haven, Dean H. E. Smith

District of Columbia

Group 1 For admission to New York licensing examination

Medical department, Columbian University—registered

1325 H st. Washington, Dean Emil A. de Schweinitz

Medical department, Georgetown University—registered

H st. N. W. (9th & 10th st.) Washington, Dean George M. Kober

Medical department, Howard University—registered

5th & Pomeroy st. N. W., Washington, Dean Robert Reyburn

Medical department, National University—class 1

1328 I st. N. W., Washington, Dean Howard H. Barker

Georgia

Group 1 For admission to New York licensing examination

Georgia College of Eclectic Medicine and Surgery—class 1

Tanner st. (near Edgewood av.) Atlanta, Pres. A. G. Thomas

Group 2 For admission to New York medical schools

Atlanta College of Physicians & Surgeons—class 1

Armstrong & Butler st. Atlanta, Dean W. S. Kendrick

Medical department, Georgia University—class 1

Augusta, Dean De Saussure Ford

Illinois**Group 1 For admission to New York licensing examination**

American College of Medicine & Surgery, medical department,

Valparaiso College; eclectic—class 2

333-39 S. Lincoln st. Chicago, Dean H. S. Tucker

American Medical Missionary College—registered

28 33d pl. Chicago and Battle Creek Mich., Pres. John H.

Kellogg

Chicago Homeopathic Medical College—class 1

Wood & York st. Chicago, Dean W. M. Stearns

Hahnemann Medical Coll. & Hospital; homeopathic—class 1

2811-13 Cottage Grove av. Chicago, Registrar W. Henry

Wilson

Hering Med. Coll. & Hospital; homeopathic—registered

3832-34 Rhodes av. Chicago, Dean J. T. Kent

Dunham united with Hering in 1902, and Midland University became
Ruskin January 1903.

Illinois Medical College—class 1

182-84 Washington boulevard, Chicago, Dean B. Brindley

Eads

Medical department, Illinois University—class 1

Congress & Honore st. Chicago, Dean William E. Quine

Rush Medical College (Chicago University)—registered

W. Harrison st. (Hermitage av. & Wood) Chicago, Dean

John M. Dodson

Group 2 For admission to New York medical schools

Bennett College of Eclectic Medicine & Surgery—class 1

Ada & Fulton st. Chicago, Dean Anson L. Clark

College of Medicine & Surgery of Chicago; physiomedical—
class 2

245 Ashland boulevard cor. Van Buren st. Chicago, Dean

H. Paxton Nelson

Harvey Medical College—class 1

167-71 S. Clark st. Chicago, Pres. Frances Dickinson

Jenner Medical College of Chicago—class 2

196-98 E. Washington st. Chicago, Sec. William Rittenhouse

Medical department, Northwestern University—class 1

2421-37 Dearborn st. Chicago, Dean Nathan S. Davis

Indiana**Group 1 For admission to New York licensing examination****Medical College of Indiana (Univ. of Indianapolis)—registered**

Senate av. & Market st. Indianapolis, Dean Henry Jameson

Physio-medical College of Indiana—registered

Alabama & North st. Indianapolis, Sec. C. T. Bedford

Group 2 For admission to New York medical schools**Central College of Physicians & Surgeons—class 1**

Pennsylvania & South st. Indianapolis, Dean George D.

Kahlo

Eclectic Medical College of Indiana—class 3

Indianapolis, Dean R. T. Laycock

Fort Wayne College of Medicine—class 1

Superior st. (foot of Fulton), Fort Wayne, Dean Christian

B. Stemen

Iowa**Group 1 For admission to New York licensing examination****Medical department, Drake University—registered**

4th st. (near Mercy hospital) Des Moines, Dean D. S.

Fairchild

Med. department, State Univ. of Iowa; homeopathic—class 1

Iowa City, Sec. W. L. Bywater

Group 2 For admission to New York medical schools**Keokuk Medical College—class 1**

7th & Blondeau st. Keokuk, Pres. George F. Jenkins

Medical department, State University of Iowa—registered

Iowa City, Sec. E. W. Rockwood

Sioux City College of Medicine—class 1

14th & Jones st. Sioux City, Dean H. A. Wheeler

Kansas

Group 1 For admission to New York licensing examination
Kansas Medical College, dep't Washburn College—class 1
12th & Tyler st. Topeka, Dean John E. Minney
School of medicine, University of Kansas—class 2
Mt Oread, Lawrence, Acting Dean C. E. McClung

Group 2 For admission to New York medical schools
Medical department, Kansas City University—class 1
Central & Simpson av. Kansas City, Dean J. E. Sawtell

Kentucky

Group 1 For admission to New York licensing examination
Kentucky School of Medicine—registered
Center st. (Walnut & Chestnut) Louisville, Dean William
H. Wathen

Louisville Medical College—registered
1st & Chestnut st. Louisville, Dean C. W. Kelly
Medical department, Kentucky University—registered
Broadway (1st & 2d st.) Louisville, Dean Thomas C. Evans
Medical department, University of Louisville—registered
8th & Chestnut st. Louisville, Dean J. M. Bodine

Group 2 For admission to New York medical schools
Louisville National Medical College—class 3
1st & Green st. Louisville, Dean W. A. Burney
Medical department, Central University of Kentucky—class 1
Chestnut st. (opposite city hospital) Louisville, Dean P.
Richard Taylor
Southwestern Homeopathic Medical College—class 2
635 6th st. Louisville, Dean A. Leight Monroe

Louisiana

Group 1 For admission to New York licensing examination
Medical department, New Orleans University—class 1
Canal & Robertson st. New Orleans, Dean H. J. Clements

Group 2 For admission to New York medical schools
Medical department, Tulane University of Louisiana—class 2
New Orleans, Dean Stanford E. Chaillé

Maine

Group 1 For admission to New York licensing examination
Medical department, Bowdoin College—registered
Brunswick, 1st & 2d years, Dean Alfred Mitchell
Chadwick st. Portland, 3d & 4th years, Deputy Dean
Charles O. Hunt

Maryland

Group 1 For admission to New York licensing examination
Baltimore Medical College—registered
Madison st. & Linden av. Baltimore, Dean David Streett
Baltimore University School of Medicine—class 1
21-29 N. Bond st. Baltimore, Dean Hampson H. Biedler
College of Physicians & Surgeons—registered
Calvert & Saratoga st. Baltimore, Dean Thomas Opie
Medical department, Johns Hopkins University—registered
Washington & Monument st. Baltimore, Dean W. H.
Howell
School of medicine, University of Maryland—registered
Lombard & Greene st. Baltimore, Dean R. Dorsey Coale
Southern Homeopathic Medical College—class 1
Mount st. (north of Riggs av.) Baltimore, Dean George T.
Shower
Woman's Medical College of Baltimore—registered
McCulloh & Hoffman st. Baltimore, Dean R. H. Thomas
Group 2 For admission to New York medical schools
Maryland Medical College—class 1
1114-20 W. Baltimore st. Baltimore, Dean J. William Funck

Massachusetts

Group 1 For admission to New York licensing examination
College of Physicians & Surgeons—registered
517 Shawmut av. Boston, Dean Charles H. Cobb
Medical school, Harvard University—registered
688 Boylston st. Boston, Dean William L. Richardson
School of medicine, Boston Univ.; homeopathic—registered
E. Concord st. Boston, Dean John P. Sutherland
Tufts College Medical School—registered
416-30 Huntington av. Boston, Dean Harold Williams

Michigan

Group 1 For admission to New York licensing examination
Dep't of medicine & surgery, Michigan Univ.—registered
Ann Arbor, Dean Victor C. Vaughan
Detroit College of Medicine—registered
St Antoine, Catharine & Mullett st. & Gratiot av. Detroit,
Sec. H. O. Walker
Homeopathic medical school, Michigan Univ.—registered
Ann Arbor, Dean Wilbert B. Hinsdale

Group 2 For admission to New York medical schools
Detroit Homeopathic Medical College—class 2
Lafayette av. & 3d st. Detroit, Dean D. A. MacLachlan
Medical department, Grand Rapids Medical College—class 1
132-34 East st. Grand Rapids, Dean Clarence White
Michigan College of Medicine & Surgery—registered
Michigan av. & 2d st. Detroit, Dean Hal C. Wyman
Saginaw Valley Medical College—class 1
N. Baum & Tuscola st. Saginaw, Sec. D. B. Cornell
Consolidated with preceding school June 25, 1903, and under its title.

Minnesota

Group 1 For admission to New York licensing examination
College of Homeopathic Medicine & Surgery (Minnesota Univ.)
—registered
Minneapolis, Dean Alonzo P. Williamson
College of Medicine & Surgery (Minnesota Univ.)—registered
Minneapolis, Dean Parks Ritchie
Medical department, Hamline University—registered
5th & 7th av. south, Minneapolis, Dean George C. Barton

Mississippi

Group 1 For admission to New York licensing examination
Medical department, University of Mississippi—class 2
University P. O., Chanc. Robert B. Fulton

Missouri

Group 1 For admission to New York licensing examination
Central Medical College—class 2
9th & Felix st. St Joseph, Pres. T. E. Potter

Marion-Sims-Beaumont College of Medicine, dep't St Louis Univ.—class 1

Grand av. & Caroline st. St Louis, Pres. Young H. Bond

Medical department, University of Missouri—registered

Columbia, Dean Andrew W. McAlester

Medical department, Washington University—registered

29th & Locust st. St Louis, Sec. W. H. Warren

Group 2 For admission to New York medical schools

American Medical College; eclectic—class 2

407 S. Jefferson av. St Louis, Dean E. Younkin

Barnes Medical College—class 1

Garrison & Lawton av. St Louis, Pres. C. H. Hughes

Ensworth Medical College—class 1

7th & Jule st. St Joseph, Dean Jacob Geiger

Homeopathic Medical College of Missouri—class 1

Jefferson av. & Howard st. St Louis Dean W. B. Morgan

Hahnemann Medical College (Kansas City Univ.); homeopathic—class 1

561 Cherry st. Kansas City, Dean W. H. Jenney

Kansas City Homeopathic Medical College—class 1

1020 E. 10th st. Kansas City, Dean Sam H. Anderson

The two preceding schools united in 1902 under the title

Kansas City Hahnemann Medical College—class 1

1020 E. 10th st. Kansas City, Dean Sam H. Anderson

Kansas City Medical College—class 1

Washington & 7th st. Kansas City, Dean Andrew L. Fulton

Medico Chirurgical College—class 2

914-18 Independence av. Kansas City, Dean George O. Coffin

St Louis College of Physicians & Surgeons—class 1

Jefferson av. & Gamble st. St Louis, Dean Waldo Briggs

University Medical College—class 1

911-13 E. 10th st. Kansas City, Dean Charles F. Wainwright

Woman's Medical College—class 2

Missouri av. & Campbell st. Kansas City, Dean Nannie P. Lewis

Nebraska

Group 1 For admission to New York licensing examination

Medical department, University of Omaha—class 1

12th & Pacific st. Omaha, Dean August F. Jonas

In 1902 it became the

College of medicine, University of Nebraska—registered

Lincoln, Dean Henry B. Ward

First and second medical years at both Omaha and Lincoln

Third and fourth years at Omaha only

Group 2 For admission to New York medical schools

Medical department, Cotner University; eclectic—class 2

121 S. 14th st. Lincoln, Dean Jerome M. Keys

Medical department, Creighton University—class 1

14th & Davenport st. Omaha, Dean D. C. Bryant

New Hampshire

Group 1 For admission to New York licensing examination

Dartmouth Medical College—registered

Hanover, Sec. Gilman D. Frost

New York

Group 1 For admission to New York licensing examination

Albany Medical College (Union University)—registered

Eagle st. (Lancaster & Jay) Albany, Dean Albert Vander Veer

Coll. of Physicians & Surgeons (Columbia Univ.)—registered

Amsterdam av. (59th & 60th st.) New York, Acting Dean John G. Curtis

Eclectic Medical College of City of New York—registered

239 E. 14th st. New York, Dean George W. Boskowitz

Long Island College Hospital—registered

Henry st. (near Atlantic av.) Brooklyn, Sec. J. H. Raymond

Medical department, Buffalo University—registered

High st. (near Main) Buffalo, Dean Matthew D. Mann

Medical department, Cornell University—registered

1st av. (27th & 28th st.) New York, Dean William M. Polk
Ithaca, Sec. Abram T. Kerr

Medical department, Syracuse University—registered
Orange st. (E. Genesee & E. Fayette st.) Syracuse, Dean
Henry D. Didama

New York Homeopathic Medical College—registered
East Boulevard (63d & 64th st.) New York, Dean William
H. King

New York Med. Coll. & Hospital for Women; homeopathic—
registered

17-19 W. 101st st. New York, Dean M. Belle Brown
University & Bellevue Hospital Medical College—registered
26th st. & 1st av. New York, Sec. Egbert Le Fevre

North Carolina

Group 1 For admission to New York licensing examination
Medical school, University of North Carolina—class 2
Chapel Hill, Dean Richard H. Whitehead
Raleigh, Dean Hubert A. Royster [the two years at Raleigh
not recognized]

North Carolina Medical College—class 2
Davidson, Pres. John P. Munroe

Group 2 For admission to New York medical schools
Medical department, Shaw University—class 2
Raleigh, Dean James McKee

Ohio

Group 1 For admission to New York licensing examination
Cleveland Homeopathic Medical College—registered
53 Bolivar st. Cleveland, Registrar A. B. Schneider
Eclectic Medical Institute—registered
Court & Plum st. Cincinnati, Sec. John K. Scudder
Medical department, Ohio Wesleyan University—registered
Central av. (cor. Brownell st.) Cleveland, Dean R. E.
Skeel

Medical department, Western Reserve University—registered
St Clair & Erie st. Cleveland, Dean Benjamin L. Millikin
Ohio Medical University—registered
Buttles av. & Park st. Columbus, Dean George M. Waters

Pulte Medical College; homeopathic—class 1

7th & Mound st. Cincinnati, Dean J. D. Buck

Starling Medical College—registered

State & 6th st. Columbus, Dean Starling Loving

Group 2 For admission to New York medical schools

Cincinnati College of Medicine & Surgery—class 1

1625-27 Pine st. Cincinnati, Dean T. V. Fitzpatrick

Extinct 1902

Laura Memorial Medical College—class 2

618 W. 6th st. Cincinnati, Dean John M. Withrow

Absorbed by Miami Medical College 1903

Medical department, University of Cincinnati—class 1

McMicken av. (head of Elm st.) Cincinnati, Dean P. S. Conner

Miami Medical College—class 1

217 W. 12th st. (Elm & Plum) Cincinnati, Dean J. C. Oliver

Under contract to graduate the students of Laura Memorial Medical College

Toledo Medical College—class 1

Cherry & Page st. Toledo, Dean William A. Dickey

Oklahoma

Group 1 For admission to New York licensing examination

Medical department, Oklahoma University—class 3

Norman, Pres. David R. Boyd

Oregon

Group 1 For admission to New York licensing examination

Medical department, Willamette University—class 1

Salem, Dean W. H. Byrd

Group 2 For admission to New York medical schools

Medical department, University of Oregon—class 1

Lovejoy & 23d st. Portland, Dean Simeon E. Josephi

Pennsylvania

Group 1 For admission to New York licensing examination

Hahnemann Med. Coll. & Hospital; homeopathic—registered

Broad st. (above Race) Philadelphia, Dean Charles M. Thomas

Jefferson Medical College—registered

10th & Walnut st. Philadelphia, Dean J. W. Holland

Medical department, University of Pennsylvania—registered

36th st. & Woodland av. Philadelphia, Dean Charles H. Frazier

Medico Chirurgical College—registered

Cherry st. (17th & 18th) Philadelphia, Dean Seneca Egbert

Western Pennsylvania Medical College—registered

Brereton av. & 30th st. Pittsburg, Dean J. C. Lange

Woman's Medical College of Pennsylvania—registered

21st st. & N. College av. Philadelphia, Dean Clara Marshall

Philippines

Group 2 For admission to New York medical schools

Medical Faculty (University of Santo Tomás)—class 1

Manila, Rector Santiago Payá

South Carolina

Group 2 For admission to New York medical schools

Medical College of the State of South Carolina—class 1

Charleston, Dean Francis L. Parker

Tennessee

Group 1 For admission to New York licensing examination

Medical department, Grant University—class 1

McCallie & Baldwin st. Chattanooga, Dean E. A. Cobleigh

Medical department, Nashville University—registered

Market & Elm st. Nashville, Dean William G. Ewing

Medical department, Tennessee University—class 1

612-16 Broad st. Nashville, Dean Paul F. Eve

Medical department, Vanderbilt University—class 1

Elm & Sumner st. Nashville, Sec. George H. Price

Group 2 For admission to New York medical schools

Medical department, University of the South—class 2

Sewanee, Dean John S. Cain

Meharry Medical Department, Walden University—class 1

Maple & Chestnut st. Nashville, Dean G. W. Hubbard

Memphis Hospital Medical College—class 1

Union & Marshall av. & Myrtle st. Memphis, Dean W. B.

Rogers

Tennessee Medical College—class 1

Cleveland st. & Dameron av. Knoxville, Dean Charles P. McNabb

Texas

Group 1 For admission to New York licensing examination

Baylor University Medical College—class 1

S. Ervay st. (opposite city park) Dallas, Dean Edward H. Cary

Medical department, Texas University—registered

Avenue B (9th & 10th st.) Galveston, Dean Allen J. Smith

Group 2 For admission to New York medical schools

Medical department, Fort Worth University—class 2

7th & Rusk st. Fort Worth, Dean Bacon Saunders

Vermont

Group 1 For admission to New York licensing examination

Medical department, Vermont University—registered

Pearl st. College park, Burlington, Dean H. C. Tinkham

Virginia

Group 1 For admission to New York licensing examination

Medical College of Virginia—registered

Marshall & College st. Richmond, Dean Christopher Tompkins

Medical department, University of Virginia—registered

University station, Charlottesville, Dean W. G. Christian

University College of Medicine—registered

Clay & 12th st. Richmond, Dean J. Allison Hodges

West Virginia

Group 1 For admission to New York licensing examination

Medical department, West Virginia University—class 2

Morgantown, Pres. D. B. Purinton

Wisconsin

Group 2 For admission to New York medical schools

Milwaukee Medical College—class 1

9th & Wells st. Milwaukee, Dean W. Henry Earles

Wisconsin College of Physicians & Surgeons—class 1

4th st. & Reservoir av. Milwaukee, Pres. A. H. Levings

Canada**Manitoba**

Group 2 For admission to New York medical schools

Manitoba Medical College—registered

Winnipeg, Dean H. H. Chown

Nova Scotia

Group 1 For admission to New York licensing examination

Dalhousie University (faculty of medicine)—registered

Halifax, Dean George L. Sinclair

Halifax Medical College—registered

Halifax, Registrar L. M. Silver

Ontario

Group 1 For admission to New York licensing examination

Faculty of medicine, University of Toronto—registered

Toronto, Dean R. A. Reeve

Medical department, Western University—registered

Waterloo & York st. London, Dean W. H. Moorhouse

Ontario Medical College for Women (for degrees from Trinity or Toronto)—registered

Toronto, Dean R. B. Nevitt

Queens University Faculty of Medicine, Royal College of Physicians & Surgeons—registered

Kingston, Dean Fife Fowler

Trinity Medical College—registered

Toronto, Dean Walter B. Geikie

Group 2 For admission to New York medical schools

Ontario Medical College for Women—class 1

Toronto, Dean R. B. Nevitt

Trinity University—class 1

Toronto, Registrar William Jones

Quebec

Group 1 For admission to New York licensing examination

Faculty of medicine, McGill University—registered

Montreal, Dean Thomas D. Roddick

Medical faculty, University of Bishop's College—registered

Montreal, Dean F. W. Campbell

Group 2 For admission to New York medical schools

School of medicine & surgery, Laval University—registered
Montreal, Dean J. P. Rottot

Cuba**Havana****Group 2 For admission to New York medical schools**

Medical department, Havana Univ., faculty of med. & phar.—
class 1

Havana, Rector Leopoldo Berriel Y. Fernández

15 MEDICAL SCHOOL SUMMARIES 1892-1903

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	Decade
Number of Institutions.....	15	15	15	15	15	15	14	13	13	13	13	2
Officers of Instruction.....	704	838	818	905	958	1 008	1 025	1 056	1 080	1 130	1 179	475
Students in M.D. course.....	2 352	2 502	2 704	2 724	2 900	2 567	2 963	2 170	2 262	2 479	2 625	173
Unclassified.....	134	115	113	154	299	190	108	153	126	182	134	.....
Graduate course.....	881	803	939	987	743	825	864	1 126	1 040	1 063	1 063	182
Total students.....	3 367	3 420	3 756	3 875	4 025	3 582	3 835	3 449	3 428	3 744	3 722	355
Students holding degrees.....	1 302	1 233	1 406	1 592	1 315	1 394	1 435	1 668	1 554	1 619	1 575	273
M.D. conferred.....	626	559	622	602	569	670	637	463	409	404	513	-118
Library volumes.....	13 343	16 744	17 226	21 072	21 967	24 276	25 189	22 900	24 605	30 422	30 245	16 942
Total property.....	\$38 463 230	\$3 876 794	\$4 106 294	\$4 562 836	\$4 784 270	\$4 322 583	\$5 671 759	\$5 542 134	\$5 687 207	\$5 690 717	\$6 543 642	\$3 080 412
Receipts.....	\$341 540	550 502	480 044	519 147	494 945	499 981	436 795	388 896	417 268	515 544	530 085	173 535
Expenditures.....	\$889 419	483 595	697 663	744 012	815 631	480 898	432 037	408 673	415 090	502 252	493 810	-126 009

^a Including estimates for College of Physicians and Surgeons which did not report separately.

16 RESULTS OF MEDICAL LICENSING EXAMINATIONS^a

New York schools for year ending July 31, 1903

NAME	Candidates	NUMBER REJECTED		Honor	Per cent accepted
		Grad. prior to 1903	Grad. in 1903		
Albany Medical College.....	35	1	2	1	91.4
Bellevue Hospital Medical College.....	1	0	0	0	100
College of Physicians and Surgeons.....	128	6	1	7	94.5
Cornell University, medical department.....	51	0	1	5	98.03
Long Island College Hospital.....	45	0	3	4	93.3
<i>b</i> New York Eclectic Medical College.....	16	1	0	3	93.7
<i>c</i> New York Homeopathic Medical College....	23	1	0	4	95.6
<i>c</i> New York Med. Coll. and Hosp. for Women	8	0	0	0	100
New York University, medical dept.....	1	1	0	0	0
Syracuse University, medical dept.....	26	0	0	0	100
University and Bellevue Hosp. Med. Coll....	55	0	7	3	87.2
University of Buffalo, medical dept.....	45	3	1	4	91.1

^a This table would be more significant if all answer papers were rated by the same board. *b* Eclectic. *c* Homeopathic.

New York schools 1891-1903

NAME	Candidates	Number rejected	Honor	Per cent accepted
Albany Medical College.....	465	70	31	84.9
Bellevue Hospital Medical College.....	307	38	16	89.6
College of Physicians and Surgeons.....	1 231	c55	146	95.5
Cornell University, medical department.....	268	7	28	96.6
Long Island College Hospital.....	533	84	16	84.2
<i>a</i> New York Eclectic Medical College.....	131	16	12	87.7
<i>b</i> New York Homeopathic Medical College.....	258	15	72	94.1
<i>b</i> New York Medical College and Hosp. for Women	74	7	11	90.5
New York University, medical department.....	486	75	22	84.5
Niagara University, medical department....	64	9	0	85.9
Syracuse University, medical department.....	200	10	7	95
University and Bellevue Hospital Medical College	240	18	19	92.5
University of Buffalo, medical department.....	508	47	16	90.7
Woman's Medical College of New York Infirmary	95	6	9	93.6

^a Eclectic. *b* Homeopathic. *c* Including one candidate who failed to complete his examination.

RESULTS OF PARTIAL EXAMINATIONS

New York schools for year ending July 31, 1903

NAME	Candidates	Number rejected	Per cent accepted
Albany Medical College.....	27	2	92.5
College of Physicians and Surgeons.....	64	3	95.3
Cornell University, medical department.....	46	0	100
Long Island College Hospital.....	24	0	100
New York Eclectic Medical College.....	7	0	100
New York Homeopathic Medical College.....	11	0	100
New York Medical College and Hospital for Women....	5	0	100
Syracuse University, medical department.....	24	1	95.8
University and Bellevue Hospital Medical College.....	21	0	100
University of Buffalo, medical department.....	a14	.....	.....

a Including one candidate who failed to complete his examination.

Per cent licensed^a

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903
Examined on graduation...	91.8	91	90	87.3	87.3	89.3	94.1	96.4	94.4	95.6	95.2
Examined after one year's practice	93.8	90	82	76.8	87.4	86.6	89.1	86.2	90.3	84.4	90.7
Examined after two years' practice	88.4	87	85	92	78.5	78.5	82.6	82.2	85.1	85.7	95.8
Examined after from 3 to 40 years' practice.....	89.2	77	87	74.1	75.5	79	76.2	80.2	75.7	79.4	82.2

a Each candidate who fails is counted only once.

Rejections by topics

	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903
Anatomy.....	12	48	70	70	55	49	56	61	56	32
Physiology and hygiene.....	12	16	31	53	41	29	55	68	52	63
Chemistry	18	62	75	73	67	62	38	49	46	33
Surgery.....	17	36	60	56	54	39	58	46	4	35
Obstetrics.....	44	67	57	58	62	25	40	52	34	44
Pathology and diagnosis.....	33	65	81	83	58	86	74	58	57	56
Therapeutics, practice and materia medica.....	15	59	70	83	78	51	34	46	45	34

17 COMPARISON OF MEDICAL SCHOOLS IN NEW YORK AND OTHER STATES AND COUNTRIES

New York schools

NAME	Candidates	Anatomy	Physiology and hygiene	Chemistry	Surgery	Obstetrics	Pathology and diagnosis	Therapeutics, practice and materia medica	Total
Albany Medical College.....	35	1	1	1	1	...	1	...	5
College of Physicians and Surg. ...	128	1	7	2	1	1	1	8	21
a Cornell University.....	51	...	...	...	...	...	...	...	...
Long Island College Hospital.....	45	1	2	1	3	1	2	2	13
N. Y. Eclectic Medical College....	16	1	1	1	...	1	2	...	6
N. Y. Hom. Med. Col. and Hosp. ...	23	1	...	...	...	...	1	...	2
N. Y. University, medical dep't. ...	1	1	1	...	...	...	1	...	3
Univ. and Bellevue Hosp. Med. C. ...	55	...	1	...	5	...	1	...	7
University of Buffalo.....	45	3	3	...	1	1	4	2	14
Total	399	9	16	5	11	4	13	12	70

Schools in other states

NAME	Candidates	Anatomy	Physiology and hygiene	Chemistry	Surgery	Obstetrics	Pathology and diagnosis	Therapeutics	Total
a Howard University, D. C.	1	...	...	...	...	...	...	...	...
Atlanta Med. Col., Georgia.....	2	1	1	1	...	...	1	1	5
Ga. Col. of Eclec. Med. and Surg., Ga.	1	...	...	...	...	...	1	...	1
American Med. Missionary Coll., Ill.	1	...	...	...	...	...	1	...	1
College of Physicians and Surg., Ill.	1	1	1	1	...	1	1	...	5
Hahnemann Med. Coll., Ill.....	1	1	...	1	1	1	1	1	6
Illinois Medical College.....	1	3	3	3	3	2	3	3	20
Rush Medical College, Ill.....	3	...	...	1	...	...	...	...	1
Med. Coll. of Fort Wayne, Ind....	1	1	1	1	...	...	1	1	5
Bowdoin Med. Coll., Maine.....	1	...	...	...	1	...	...	...	1
Baltimore Medical College, Md....	9	1	2	...	1	...	...	2	6
Baltimore Univ., sch. of med., Md.	4	1	3	...	...	1	3	1	9
Maryland Medical College.....	2	1	1	...	...	...	1	1	4
College of Phys. and Surg., Mass..	2	...	1	...	...	...	...	...	1
Harvard Univ., Mass.....	10	...	...	2	...	...	...	...	2
Univ. of Michigan.....	11	1	2	1	1	1	1	1	8
Willamette Univ., Oregon.....	1	...	...	1	...	...	...	...	1
University of Pennsylvania.....	37	...	1	...	...	...	...	...	1
Western Penn. Med. Coll.....	2	...	...	...	1	...	...	...	1
University of the South, Tenn.....	2	...	...	...	...	...	1	...	1
University of Vermont.....	6	...	...	1	...	...	2	1	4
Total	99	11	16	13	8	6	17	12	83

a Papers of one candidate canceled for attempted fraud.

Schools in foreign countries

NAME	Candidates	Anatomy	Physiology and hygiene	Chemistry	Surgery	Obstetrics	Pathology and diagnosis	Therapeutics	Total
Academy of Paris, France	1	...	...	...	...	1	...	...	1
University of Munich, Germany	3	1	2	...	2	1	4	2	12
University of Naples, Italy	31	6	12	9	13	19	16	7	82
University of Palermo, Italy	7	2	4	1	2	9	4	1	23
University of Turin, Italy	2	...	...	...	...	1	...	...	1
University of Bucharest, Roumania	4	...	1	...	...	2	2	...	5
Imperial Jurief (Dorpat) Univ. Russia....	2	...	...	...	...	1	...	...	1
Total	50	9	19	10	17	34	26	10	125

18 AVERAGE NUMBER OF TRIALS 1891-1903

New York schools. The following table shows the average number of trials to each New York school candidate. It also gives the number of candidates and the number of trials for each year and the per cent still rejected. By this table candidates appearing in different years are counted only once.

NAME	Year	Candidates	Trials	Total candidates	Total trials	No. still rejected	Average trials to each candidate	Per cent still rejected
Albany Medical College	91-2	1	1	407	533	14	1.3	3.43
	92-3	34	35					
	93-4	33	46					
	94-5	33	48					
	95-6	37	40					
	96-7	52	66					
	97-8	44	79					
	98-9	58	84					
	99-00	26	36					
	00-01	30	33					
	01-02	27	30					
	02-03	32	35					
	91-2	2	2					
	92-3	23	31					
	93-4	43	60					
Bellevue Hospital Medical College....	94-5	32	43	335	429	5	1.28	1.49
	95-6	42	46					
	96-7	52	62					
	97-8	81	112					
	98-9	33	45					
	99-00	16	17					
	00-01	4	4					
	01-02	6	6					
	02-03	1	1					
	91-2	1	1					
	92-3	35	38					
	93-4	45	46					
	94-5	119	132					
	95-6	134	141					
	96-7	109	125					
College of Physicians and Surgeons...	97-8	107	132	1 187	1 286	10	1.08	.84
	98-9	116	121					
	99-00	161	167					
	00-01	127	134					
	01-02	109	115					
	02-03	124	134					
	98-9	25	25					
Cornell University, med. dep't.....	99-00	51	54	202	214	11	1.05	.49
	00-01	80	85					
	01-02	46	49					
	02-03	50	51					

New York schools (continued)

NAME	Year	Candidates	Trials	Total candidates	Total trials	No. still rejected	Average trials to each candidate	Per cent still rejected
Eclectic Medical College	91-2	...	...	119	145	41.21	3.36	
	92-3	3	5					
	93-4	3	5					
	94-5	7	7					
	95-6	20	21					
	96-7	7	13					
	97-8	16	19					
	98-9	17	20					
	99-00	15	18					
	00-01	11	13					
	01-02	6	6					
	02-03	14	18					
Long Island College Hospital.....	91-2	1	1	458	662	01.44	2.18	
	92-3	20	22					
	93-4	19	21					
	94-5	36	49					
	95-6	57	70					
	96-7	54	78					
	97-8	51	101					
	98-9	61	94					
	99-00	38	60					
	00-01	47	67					
	01-02	32	52					
	02-03	42	47					
New York Homeopathic Med. Col.....	91-2	1	1	244	272	11.11	.4	
	92-3	8	10					
	93-4	25	27					
	94-5	33	37					
	95-6	24	26					
	96-7	14	20					
	97-8	12	14					
	98-9	29	36					
	99-00	31	32					
	00-01	24	24					
	01-02	21	22					
	02-03	22	23					
N. Y. Med. Col. & Hos. for Women...	91-2	1	1	67	77	01.14		
	92-3	1	1					
	93-4	12	14					
	94-5	9	11					
	95-6	5	5					
	96-7	5	5					
	97-8	3	3					
	98-9	5	5					
	99-00	3	5					
	00-01	12	13					
	01-02	4	6					
	02-03	7	8					

New York schools (*continued*)

NAME	Year	Candidates	Trials	Total candidates	Total trials	No. still rejected	Average trials to each candidate	Per cent still rejected
New York University, med. dep't.....	91-2	2	2	432	547	21	1.26	4.86
	92-3	39	43					
	93-4	44	58					
	94-5	64	92					
	95-6	66	71					
	96-7	85	105					
	97-8	86	112					
	98-9	29	43					
	99-00	9	13					
	00-01	5	5					
	01-02	2	2					
	02-03	1	1					
	91-2	...	...					
	92-3	8	5					
	93-4	13	14					
	94-5	8	10					
	95-6	12	18					
	96-7	11	13					
	97-8	6	7					
	98-9	1	1					
	99-00	2	2					
	00-01	1	1					
	01-02	...	...					
	02-03	...	...	57	66	2	1.15	3.5
Syracuse University, med. dep't.....	91-2	...	...	191	205	1	1.07	.52
	92-3	6	6					
	93-4	10	15					
	94-5	8	8					
	95-6	24	24					
	96-7	23	25					
	97-8	24	26					
	98-9	7	10					
	99-00	24	25					
	00-01	15	15					
	01-02	25	25					
	02-03	25	26					
	98-9	61	61					
	99-00	49	56					
	00-01	33	39					
	01-02	33	38					
	02-03	54	55	230	249	8	1.08	3.47
Univ. & Bellevue Hos. Med. Col.....	91-2	2	2	469	584	8	1.24	1.7
	92-3	21	24					
	93-4	14	23					
	94-5	51	62					
	95-6	51	60					
	96-7	60	73					
	97-8	56	104					
	98-9	39	44					
	99-00	45	50					
	00-01	41	46					
	01-02	47	50					
	02-03	42	48					
University of Buffalo, med. dep't.....	91-2	...	...	469	584	8	1.24	1.7
	92-3	...	...					
	93-4	...	...					
	94-5	...	...					
	95-6	...	...					
	96-7	...	...					
	97-8	...	...					
	98-9	...	...					
	99-00	...	...					
	00-01	...	...					
	01-02	...	...					
	02-03	...	...					
	91-2	...	...					
	92-3	...	...					
	93-4	...	...					
	94-5	...	...					
	95-6	...	...					
	96-7	...	...					
	97-8	...	...					
	98-9	...	...					
	99-00	...	...					
	00-01	...	...					
	01-02	...	...					
	02-03	...	...					

New York schools (concluded)

NAME	Year	Candidates		Total candidates	Total trials	No. still rejected	Average trials to each candidate	Per cent still rejected
			Trials					
Woman's Med. Col. of N. Y. Infirm...	91-2	...	...	90	97	11.07	1.11	
	92-3	8	8					
	93-4	8	8					
	94-5	19	21					
	95-6	7	7					
	96-7	15	16					
	97-8	15	15					
	98-9	12	14					
	99-00	5	7					
	00-01	1	1					
	01-02	...	...					
	02-03	...	...					

**19 DENTAL SCHOOLS OF UNITED STATES, CANADA AND CUBA REGISTERED
OR ACCREDITED JULY 1, 1904**

Alphabetically arranged by states and provinces

United States

Alabama

Group 1 For admission to New York licensing examination

Birmingham Dental College—registered

Avenue F & 20th st. Birmingham, Dean Charles A. Merrill

California

Group 1 For admission to New York licensing examination

College of Dentistry, University of Southern California—registered

Junction Main, Spring & Temple st. Los Angeles, Dean
Garrett Newkirk

Dental department, College of Physicians and Surgeons—class 1
14th st. (Mission & Valencia) San Francisco, Dean D. A.
Hodghead

Group 2 For admission to New York dental schools

College of Dentistry, University of California—registered

South of Golden Gate park, San Francisco, Dean Harry P.
Carlton

Colorado

Group 2 For admission to New York dental schools

Colorado College of Dental Surgery, University of Denver—
class 1

Arapahoe & 14th st. Denver, Dean W. T. Chambers

District of Columbia

Group 1 For admission to New York licensing examination

Dental college of medical dep't, Howard University—registered
5th & Pomeroy st. N. W. Washington, Dean Robert Rey-
burn

Dental department, Columbian University—registered
1325 H st. N. W. Washington, Dean J. Hall Lewis

Dental department, Georgetown University—registered
H st. N. W. (9th & 10th) Washington, Dean William N.
Cogan

Dental department, National University—class 1

1328 9th st. N. W. Washington, Dean J. Roland Walton

Georgia

Group 1 For admission to New York licensing examination

Atlanta Dental College—registered

38½ Marietta st. Atlanta, Dean H. R. Jewett

Dental department, Atlanta College of Physicians and Surgeons—registered

Opposite Grady hospital (near Union depot) Atlanta,
Dean Sheppard W. Foster

Illinois

Group 1 For admission to New York licensing examination

Chicago College of Dental Surgery, department Lake Forest University—registered

Wood & Harrison st. Chicago, Dean Truman W. Brophy
Dental department, Illinois University—registered

813 W. Harrison st. Chicago, Acting Dean B. J. Cigrand

Group 2 For admission to New York dental schools

Dental school, Northwestern University—registered

Dearborn & Lake st. Chicago, Dean Greene V. Black

Indiana

Group 1 For admission to New York licensing examination

Central College of Dentistry—registered

Illinois & Ohio st. Indianapolis, Dean S. E. Earp

Indiana Dental College dep't of dental surgery, University of Indianapolis—registered

Ohio & Delaware st. Indianapolis, Dean George E. Hunt

Iowa

Group 1 For admission to New York licensing examination

Dental department, University of Iowa—registered

Iowa City, Dean William S. Hosford

Keokuk Dental College, dental dep't Keokuk Medical College—registered

Keokuk, Dean B. C. Hinkley

Kentucky

Group 1 For admission to New York licensing examination

Louisville College of Dentistry, dental dep't Central University of Kentucky—registered

Brook st. & Broadway, Louisville, Dean William E. Grant

Louisiana**Group 2 For admission to New York dental schools**

New Orleans College of Dentistry—class 1

New Orleans, Dean A. G. Friedrichs

Maryland**Group 1 For admission to New York licensing examination**

Baltimore College of Dental Surgery—registered

Eutaw & Franklin st. Baltimore, Dean M. W. Foster

Dental department, Baltimore Medical College—registered

N. Howard st. (near Madison) Baltimore, Dean J. E. Orrison

Dental department, University of Maryland—registered

Lombard & Greene st. Baltimore, Dean F. J. S. Gorgas

Massachusetts**Group 1 For admission to New York licensing examination**

Dental school, Harvard University—registered

N. Grove st. Boston, Dean Eugene H. Smith

Tufts College Dental School—registered

Huntington & Rogers av. (Courtland & Drisko) Boston,
Dean Harold Williams

Michigan**Group 1 For admission to New York licensing examination**

College of dental surgery, University of Michigan—registered

Ann Arbor, Dean Cyrenus G. Darling

Department of dental surgery, Detroit College of Medicine—
registered

St Antoine, Catherine & Mullett st. & Gratiot av. Detroit, Dean
Theo. A. McGraw

Minnesota**Group 1 For admission to New York licensing examination**

College of dentistry, University of Minnesota—registered

Minneapolis, Dean William P. Dickinson

Missouri**Group 1 For admission to New York licensing examination**

Kansas City Dental College—registered

10th st. & Troost av. Kansas City, Pres. J. D. Patterson

Marion-Sims Dental College—registered

Grand av. & Caroline st. St Louis, Dean Milton C. Marshall
Missouri Dental College, dental department Washington University—registered

27th & Locust st. St Louis, Dean John H. Kennerby
Western Dental College—registered

11th & Locust st. Kansas City, Dean D. J. McMillen

Nebraska

Group 1 For admission to New York licensing examination

Lincoln Dental College, Patron College of Dentistry, University of Nebraska—class 1

15th & O st. Lincoln, Dean W. Clyde Davis

Group 2 For admission to New York dental schools

Dental department, University of Omaha—class 1

12th & Pacific st. Omaha, Dean A. O. Hunt

New York

Group 1 For admission to New York licensing examination

Dental department, University of Buffalo—registered

25 Goodrich st. Buffalo, Dean George B. Snow

New York College of Dentistry—registered

205-7 E. 23d st. New York, Dean Faneuil D. Weisse

New York Dental School—registered

216 W. 42d st. New York, Dean Charles M. Ford

Ohio

Group 1 For admission to New York licensing examination

Cincinnati College of Dental Surgery—registered

231-33 W. Court st. Cincinnati, Dean G. S. Junkerman

College of dentistry, Western Reserve University—registered

Bangor bldg. Prospect st. Cleveland, Dean Henry L. Ambler

Dental department, Ohio Medical University—registered

Park st. & Buttles av. Columbus, Dean Louis P. Bethel

Ohio College of Dental Surgery, dental dep't University of Cincinnati—class 1

Central av. & Court st. Cincinnati, Dean H. A. Smith

Oregon

Group 2 For admission to New York dental schools

North Pacific Dental College—registered

15th & Couch st. Portland, Dean Herbert C. Miller

Pennsylvania

Group 1 For admission to New York licensing examination

Dental dep't, Philadelphia Medico Chirurgical College—registered

Cherry st. (17th & 18th) Philadelphia, Dean Robert H. Nones

Dental dep't, University of Pennsylvania—registered

33d st. (Spruce & Locust) Philadelphia, Dean Edward C. Kirk

Pennsylvania College of Dental Surgery—registered

11th & Clinton st. Philadelphia, Dean Wilbur F. Litch

Philadelphia Dental College—registered

18th st. (below Spring garden) Philadelphia, Dean S. H. Guilford

Pittsburg Dental College, dental dep't Western University of Pennsylvania—registered

1003 Penn. av. Pittsburg, Dean Walter H. Fundenberg

Tennessee

Group 1 For admission to New York licensing examination

Meharry Dental Dep't, Walden University—registered

Maple & Chestnut st. Nashville, Dean G. W. Hubbard

Group 2 For admission to New York dental schools

Dental dep't, University of Tennessee—class 1

212-14 N. Spruce st. Nashville, Dean Joseph P. Gray

Dental dep't, Vanderbilt University—registered

N. Cherry st. Nashville, Dean D. R. Stubblefield

Virginia

Group 1 For admission to New York licensing examination

Virginia School of Dentistry, Medical College of Virginia—registered

Marshall & College st. Richmond, Dean Christopher Tompkins

Group 2 For admission to New York dental schools

Dental department, University College of Medicine—registered
Clay & 12th st. Richmond, Proctor William R. Miller

Wisconsin**Group 1 For admission to New York licensing examination**

Dental department, Milwaukee Medical College—registered
9th & Wells st. Milwaukee, Dean Henry L. Banzhaf

Group 2 For admission to New York dental schools

Department of dental surgery, Wisconsin College of Physicians
and Surgeons—class 1
4th st. & Reservoir av. Milwaukee, Dean James T. Stuart

Canada**Ontario****Group 2 For admission to New York dental schools**

Royal College of Dental Surgeons—registered
93 College st. Toronto, Dean J. Branston Willmott

Cuba**Havana**

School of dental surgery, medical faculty, Havana University—
not registered

Havana, Rector Leopoldo Berriely Fernández

20 DENTAL SCHOOL SUMMARIES 1893-1903

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	Decade
Number of schools	3	3	3	3	3	3	3	3	3	3	3	.....
Officers of instruction	69	67	88	100	107	115	104	102	102	105	115	46
Graduates course	8	9	.....	.....	.....	2	6	27	8	21	22	14
D.D.S. course	320	403	505	525	503	411	492	452	587	595	737	467
Unclassified .....	.....	1	.....	.....	8	25	.....	77	110	83	94	94
Total students	328	413	505	525	511	438	498	556	705	699	903	575
Students holding degrees	8	5	16	9	5	4	7	12	3	20	19	11
D.D.S. conferred	52	68	117	113	152	130	114	69	118	131	124	73
Library, vols	150	150	132	2	.....	173	159	183	213	213	235	85
Total property	\$123 906	\$147 733	\$147 122	\$175 800	\$185 015	\$198 816	\$201 295	\$204 982	\$210 274	\$220 183	\$247 067	\$123 071
Receipts	34 208	51 252	67 142	70 439	76 885	68 450	76 385	81 073	97 585	114 368	145 364	111 006
Expenditures	38 180	50 641	67 130	61 734	72 403	65 865	73 531	76 975	91 212	109 062	133 475	97 295

21 RESULTS OF DENTAL LICENSING EXAMINATIONS

	1896	1897	1898	1899	1900	1901	1902	1903
Examinations.....	5	5	5	5	4	4	4	4
Examined	162	264	268	222	154	194	234	234
Rejected	52	46	67	39	28	33	29	58
Per cent rejected.....	32	17.4	25	17.5	18.1	17	12.3	24.7
Licenses issued.....	110	218	201	183	126	161	205	176
Honor licenses issued.....	7	17	43	67	36	23	41	18

Per cent licensed

Each candidate who fails is counted only once.

	1896	1897	1898	1899	1900	1901	1902	1903
Examined on graduation.....	75.8	93.6	87.4	96.1	95	93	95.8	93.5
Examined after one year's practice	83.3	68.7	92.5	88	94.1	84.6	94.4	94.7
Examined after two years' practice	100	100	88.8	75	75	90	100	75
Examined after from three to 20 years' practice	40	50	80	100	100	61.5	80	66.6

Rejection by topics

	1896	1897	1898	1899	1900	1901	1902	1903
Anatomy	21	14	20	11	10	8	13	5
Physiology and hygiene.....	14	19	23	12	4	4	6	3
Chemistry and metallurgy	8	1	7	4	0	2	1	11
Oral surgery and pathology	5	9	11	15	13	3	4	2
Operative dentistry	4	9	13	9	3	1	4	12
Prosthetic dentistry	16	6	8	13	2	20	5	24
Therapeutics and materia medica	25	10	22	14	8	10	3	1
Histology	28	19	26	16	5	4	2	10

22 REJECTIONS BY SUBJECTS

New York schools

NAME	Candidates	Papers examined	Anatomy	Physiology and hygiene	Chemistry and metallurgy	Oral surgery and pathology	Operative dentistry	Prosthetic dentistry	Therapeutics and materia medica	Histology	Total written	PRACTICAL			Total failures
												Prosthetic	Operative	Total	
New York College of Dentistry	50	302	....	....	....	....	....	....	....	....	0	8	10	18	18
New York Dental School	10	80	....	....	....	....	....	....	....	....	0	2	....	2	2
α University of Buffalo, dental department ...	58	406	....	....	5	....	....	1	....	6	12	5	....	5	17
Total	118	938	....	....	5	....	....	1	....	6	12	15	10	25	37

α Two candidates examination incomplete.

Schools in other states

NAME	Candidates	Papers examined	Anatomy	Physiology and hygiene	Chemistry and metallurgy	Oral surgery and pathology	Operative dentistry	Prosthetic dentistry	Therapeutics and materia medica	Histology	Total written	PRACTICAL			Total failures
												Prosthetic	Operative	Total	
Harvard Univ. dent. dep't, Mass.	3	24	1	....	....	....	....	....	....	1	2	1	....	1	3
Univ. of Michigan, dent. dep't	1	8	....	....	1	....	....	....	....	....	1	....	....	0	1
Cincinnati Coll. of Dent. Surg., Ohio	1	8	1	1	....	1	....	....	....	....	3	....	....	0	3
Pa. Coll. of Dent. Surg. ...	8	64	1	1	....	....	....	1	....	....	3	1	....	1	4
Philadelphia Dental College	8	64	1	....	....	....	....	1	....	....	2	2	1	3	5
University of Pennsylvania	20	149	....	1	1	....	....	....	1	1	4	1	....	1	5
Exemption laws	23	180	1	....	4	1	1	1	....	2	10	3	....	3	13
Total	64	497	5	3	6	2	1	3	1	4	25	8	1	9	34

**23 VETERINARY MEDICAL SCHOOLS OF UNITED STATES AND CANADA
REGISTERED OR ACCREDITED JULY 1, 1904**

Alphabetically arranged by states and provinces

United States

District of Columbia

Group 2 For admission to New York veterinary schools

United States College of Veterinary Surgeons—class 1

222 C st. N. W. Washington, Dean C. Barnwell Robinson

Illinois

Group 1 For admission to New York licensing examination

Chicago Veterinary College—registered

2537-39 State st. Chicago, Pres. R. J. Withers

McKillop Veterinary College—class 1

1639 Wabash av. Chicago, Dean F. S. Schoenleber

Indiana

Group 2 For admission to New York veterinary schools

Indiana Veterinary College—class 2

**Market st. (Davidson & Pine) Indianapolis, Dean George
H. Roberts**

Iowa

Group 2 For admission to New York veterinary schools

Veterinary department, Iowa State College—class 1

Ames, Acting Dean W. M. Beardshear

Michigan

Group 1 For admission to New York licensing examination

Grand Rapids Veterinary College—class 2

**Butterworth av. & Indiana st. Grand Rapids, Dean Will-
iam A. McLean**

Missouri

Group 1 For admission to New York licensing examination

Kansas City Veterinary College—class 1

1404-6 Holmes st. Kansas City, Dean SESCO Stewart

New York

Group 1 For admission to New York licensing examination

New York American Veterinary College, New York University
—registered

141 W. 54th st. New York, Dean Alexander F. Liautard
New York State Veterinary College at Cornell University—
registered

East av. Ithaca, Dean James Law

Ohio

Group 1 For admission to New York licensing examination

College of veterinary medicine, Ohio State University—class 1
N. High st. Columbus, Dean David S. White

Pennsylvania

Group 1 For admission to New York licensing examination

Veterinary department, University of Pennsylvania—registered
Woodland av. (Cleveland & Spruce) Philadelphia, Dean
Leonard Pearson

Washington

Group 1 For admission to New York licensing examination

School of veterinary science, Washington Agricultural College
and School of Science—class 1
Pullman, Pres. E. A. Bryan

Canada**Ontario**

Group 2 For admission to New York veterinary schools

Ontario Veterinary College—class 2
40-46 Temperance st. Toronto, Prin. Andrew Smith

Quebec

Group 1 For admission to New York licensing examination

School of Comparative Medicine and Veterinary Science
(Laval University)—class 1
185 St Denis st. Montreal, Director V. T. Daubigny

24 VETERINARY SCHOOL SUMMARIES 1893-1903

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	Decade's growth
Number of institutions.....	2	2	2	2	3	3	3	2	2	2	2	.....
Officers of instruction.....	31	36	37	38	52	50	55	45	47	52	50	19
Graduates course.....	1	1	1	.....	.....	7	2	1	.....	.....	.....	.....
Veterinary course.....	223	232	189	147	119	89	81	75	88	103	120	8
Unclassified.....	.....	.....	.....	.....	.....	.....	.....	.....	11	88	128	128
Total students.....	224	233	190	147	110	96	83	76	99	200	251	27
Students holding degrees.....	2	14	11	9	5	10	8	6	17	19	12	10
V.S., D.V.S. and D.V.M. degrees conferred	73	64	52	55	41	40	16	15	17	16	24	—49
Library vols.....	600	600	700	900	1 500	1 633	2 909	1 480	3 043	3 220	3 451	2 851
Total property.....	\$30 750	\$30 750	“\$300”	“\$300”	\$178 223	\$175 667	\$180 103	\$172 971	\$176 717	\$158 191	\$154 191	\$127 441
Receipts.....	14 120	15 565	17 990	14 465	41 906	36 704	34 009	31 103	33 350	35 137	34 679	20 559
Expenditures.....	14 120	14 065	17 990	14 465	40 510	36 774	35 686	30 871	41 831	33 155	32 967	18 877

a Not fully reported.

25 VETERINARY LICENSING EXAMINATIONS

Results 1896-1903

	1896	1897	1898	1899	1900	1901	1902	1903
Examinations	5	5	5	5	4	4	4	4
Examined	6	12	29	20	14	12	15	22
Rejected	8	5	21	8	2	5	6	5
Per cent rejected	50	41.6	72.4	40	14.2	41.6	40	22.7
Licenses issued	3	7	8	12	12	7	9	17
Honor licenses issued	0	0	0	0	0	0	0	2

Rejections by topics

	1896	1897	1898	1899	1900	1901	1902	1903
Anatomy	2	0	2	4	1	2	1	2
Physiology and hygiene	4	2	0	0	0	2	2	1
Chemistry	2	2	6	1	2	4	6	4
Surgery	2	0	7	0	1	1	1	1
Obstetrics	1	4	8	1	0	4	0	1
Pathology, diagnosis and practice	2	3	10	0	1	5	2	2
Therapeutics and materia medica	2	1	3	1	0	2	1	1

26 APPLICATION FOR REGISTRATION OR ACCREDITING OF TRAINING SCHOOL FOR NURSES¹

This certifies that [*legal title*]

is } [*City*]
 is not } 'a department of } [*State*]
 which was legally incorporated [*date*] and is connected with
 a hospital
 a sanitarium } 'giving a course of at least two years in service under
 instruction in said institution as shown by the accompanying program or
 schedule of course, in effect 190 to 190

Application for registration with the Regents of the University of the State of New York as meeting the graduation standard fixed by statute for New York schools is hereby formally made and candidates for graduation from this school must (1) be at least 21 years of age; (2) be of good moral character; (3) have studied nursing at least two full years.

The latest announcement of requirements accompanies this application and additional information is given on the second page.

In witness whereof, I hereunto set my hand and the seal
 of this
 day of

[*Seal*]

[*Signature of executive officer and title*]

27 ADDITIONAL INFORMATION

1 There are [*number*] students now in attendance, viz first
 year, second year, third year.

2 There are beds in the hospital in which the nurses receive their training.

3 The length of this period of training is years.

4 Nurses receive practical or theoretical training or both in
 Practical Theoretical

a Medical

b Surgical (with operating)

c Gynecological

d Obstetrical

How many cases?

e Children's diseases

f Contagious

g Cooking

Materia medica

5 Nurses are trained exclusively in the hospital.

6 Nurses are sent out to private duty, in $\left\{ \begin{array}{c} 1 \\ 2 \\ 3 \end{array} \right\}$ years of their training
 for weeks.

[*Signature of the superintendent of the training school*]

¹Cancel any statements that do not apply to your school.

28 LIBRARY SCHOOL

EXAMINATIONS		1902	
Papers		Written	Accepted
General literature			
" information			
" history			
Latin, 1st year			
German, 1st year			
" 2d "			
French, 1st year		1	1
" 2d "			
Spanish, 1st year			
Italian			
Elementary bibliography		31	29
Accession department work		29	29
Elementary cataloguing			
" dictionary cataloguing		55	53
Elementary classification		33	33
Elementary reference		36	36
Shelf department work		29	29
Loan systems		24	24
Bookbinding		26	28
Advanced bibliography		20	20
Founding and government of libraries		20	19
Library buildings		16	16
Advanced cataloguing		17	17
" dictionary cataloguing		15	15
" classification		20	20
History of libraries		21	21
Indexing		31	24
Printing		2	2
Reading		20	20
Advanced reference		20	20

Examinations outside the State

UNDER AUTHORITY GRANTED JUNE 11, 1891 AND DEC. 14, 1892

Such tests are held only when satisfactory evidence is given that the rules will be strictly observed, that the integrity and dignity of the examinations will be carefully protected in every way, and that the compensation of the local examiner will not be a charge on the University treasury.

PLACE	BUILDING	EXAMINER
Wellesley Mass.....	Wellesley College Lib.....	Carrie F. Pierce

29 RESULTS OF C. P. A. EXAMINATIONS 1896-1903

	Candidates	Number rejected	Per cent accepted
1896-97	14	6	57.1
1897-98	15	9	40
1898-99	17	7	58.8
1899-1900	16	7	56.2
1900-1	17	4	76.4
1901-2	129	82	36.4
1902-3	68	58	14.7
Total	276	173	37.8

Rejections by topics

	1897	1898	1899	1900	1901	1902	1903
Theory of accounts	2	6	3	4	0	44	16
Practical accounting	4	4	4	6	3	68	53
Auditing	2	2	1	0	0	13	18
Commercial law	6	4	2	2	3	23	8

30 BUSINESS CREDENTIALS ISSUED DURING 1902-3

Browne's Brooklyn Business College

State stenographers certificate

Kilbride, Mary J.	Struthwolf, Louise
Nobbe, Lulu	Waldron, Ethel
Rosengreen, Frieda	Williams, Jennie
Schilgen, Amelia	Wisnom, Ellen

Charles Commercial School, Brooklyn

State stenographers certificate

Johnson, Irene

Egberts High School, Cohoes

State business certificate

Best, William J.	Tanner, Ruth D.
Pitts, Cora Belle	

State stenographers certificate

Archibold, Elizabeth B.	Slocum, Anna May
Best, William J.	Symper, Arthur I.
Link, Gertrude F.	Tanner, Ruth D.
Much, Edith C.	Veigle, Bertha A.
Pitts, Cora Belle	

Franklin Academy, Malone*State business diploma*

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Hefley School, Brooklyn*State business certificate*

Gerdes, John

State stenographers certificate

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Dwinell, George W. I.	Renton, Stanley Harned
Epworth, Florence May	Rhodes, Florence M.

The Henley, Syracuse*State business certificate*

Talbot, Lynn

State stenographers certificate

Born, Marion M.	King, Edith J.
Davis, Elsie E.	Lang, Lillian M.
Dorner, Arthur W.	Masten, Florence G.
Egan, Frances A.	Moroney, Elizabeth Geraldine
Gallagher, Daisy E.	O'Hara, Agnes F.
Gifford, Lawrence J.	O'Reilly, Kathryn L.
Heck, Mabel L.	Park, George F.
Hyman, Florence D.	Rackett, Anna
Jacobsen, Marie	Raymond, Daisy

La Salle Academy, New York*State stenographers diploma*

Steinbugler, John, jr

State stenographers certificate

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Leroy High School*State business diploma*

Clarke, Levi M.

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Foster, Edna

Warner, William E.

Hanau, Rebecca

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Wilson, Charles Homer

Reimer, Anna May

New York Preparatory School*State business diploma and state stenographers diploma*

Muller, Emilie

Oneonta High School*State business diploma*

Crowl, Elizabeth A.

Lyon, Hudson H.

State stenographers diploma

Crowl, Elizabeth A.

Foote, Metta

Disbrow, Laura Lee

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Mendès, Henry Eugene

St John's Catholic Academy, Syracuse*State stenographers certificate*

McCarthy, John V.

St Patrick's Academy, Catskill*State business diploma*

Hollenbeck, Estrella Elizabeth Walsh, Elizabeth

State stenographers diploma

Hollenbeck, Estrella Elizabeth Walsh, Elizabeth

Sherman Collegiate Institute, Moriah*State business diploma*

Hill, Frederic C.

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1904

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A SELECTION FROM THE
BEST BOOKS OF 1903
WITH NOTES

PREFATORY NOTE

To the Librarian

This is an annotated list of 250 books published in the United States in 1903, selected by the book board of the New York State Library and recommended to the public libraries of the State. To aid in choosing small collections of new books three classes are marked: books marked *a*, of which there are 20, are suggested to libraries which must confine their additions within narrow limits; 30 others marked *b* are also proposed to libraries that can buy 50 books; and 50 more marked *c* may be added to *a* and *b* to make up 100 books.

The remaining 150, including some reference books and a few more costly publications, are worthy careful consideration by libraries that can buy more than 100 books and by those wishing to enlarge resources in special subjects. Many of the unmarked works are of the highest merit. *Decimal Classification* numbers as used in the State Library are prefixed as a guide to libraries using this system. For convenience of libraries wishing to use them, Library of Congress printed catalogue card serial numbers are given in note type; also references to reviews. A short list of older books in materially altered editions, or transferred to other publishers, is appended.

The following from the *Journal of New Jersey libraries*, October 1903, applies equally to New York:

Look at books before buying them, if possible. Advertisements and reviews are both untrustworthy, especially where any library's special needs are to be considered.

Information about importing books, secondhand books, and even about new books which are under consideration, is always cheerfully given, when asked, by the larger libraries in the State.

Do not buy encyclopedias while in process of publication. They are aggravations until complete, and can always be bought more cheaply than they are at first offered a few months after publication. Read Eugene Field's story of the "Cyclopedy," and take warning. The same rule holds as to all subscription books. Avoid them. Shun books in parts. They cost more than they are worth to a library. They turn up in secondhand stores a few months after completion at low prices. Deluded purchasers find them white elephants and sell them. *Finest Orations, Noblest Essays, Royal Flim Flams, Huge Anthologies*, and the like all come to the secondhand man. Get them of him, if you must. In a small library they are generally almost useless. In subscription books, cases like this are not uncommon. Maspero wrote several large and learned volumes, in French, on Egypt and Chaldea. They were translated and published in three or four volumes in England, costing libraries in this country about \$5 each. An American publisher reprints them in 12 small volumes with a few additional colored cuts, on heavier paper and in larger type and offers them through agents for \$84—and libraries buy them!

Do not buy "sets" or complete editions of authors. Buy the volumes you need and as you need them. A complete set always includes several volumes you do not need.

Specify the edition you wish of standard books when you can, unless you find a bookseller able and willing to select them wisely for you.

While this list has been prepared with special reference to smaller public libraries, and some of these books are not recommended for school use, it will also be of much service to schools. Almost all the list is available. Any book under the heading "Juvenile" may be bought for academic libraries. But there are some books of fiction found here which serve a legitimate purpose in the public library by providing wholesome entertainment for a very different class of readers, yet have not enough positive value, either as literature or as a spur to historical study to justify their purchase by the school.

MELVIL DEWEY

Director

Albany, July 9, 1904

REFERENCE BOOKS

- 016.823 b Baker, E. A.** Descriptive Guide to the Best Fiction, British and American. Macmillan \$2.50
- 3-8699** 4500 titles, grouped by period, with descriptive notes, publishers and prices; also lists of historical romances arranged chronologically. Includes chief translations of foreign novels. Fully indexed and surprisingly excellent in selection and annotation. Nation, 76:249; Ath. 1903, 1:402; Acad. 64:225
- 027 Clark, J. W.** The Care of Books: an Essay on the Development of Libraries and their Fittings from the Earliest Times to the End of the 18th Century. Macmillan \$5 n
- 2-10340** Concerned with buildings and methods of care and administration, not literary content. Deals largely with university and monastic types. Scholarly, sumptuously printed, 156 illustrations. Acad. 61:460; Ath. 1901, 2:624
- 070 Shuman, E. L.** Practical Journalism: a Complete Manual of the Best Newspaper Methods. Appleton \$1.25 n
- 3-19681** On the reporter's education, positions, salaries, newsgathering, the Sunday supplement, women in newspaper work, advertisements, law of libel and copyright, etc. Julian Ralph's *Making of a Journalist*, Harper \$1.25 n., largely an account of his own experiences, is entertaining and suggestive; Gavit's *Reporter's Manual*, J. P. Gavit, Albany, \$1 n., is a compact, self-indexing pocket book of valuable suggestion to the untrained and useful reminder to the experienced. Nation, 77:306
- 920.042 b Lee, Sidney, ed.** Dictionary of National Biography: Index and Epitome. Macmillan \$6.25 n
- 3-12075** Summary of monumental work in 66 volumes. Every person entered there receives here approximately one fourteenth of original space. 30,378 articles, 3474 cross references. Specially valuable to libraries unable to buy expensive set for authoritative sketches and characterizations of distinguished Englishmen. Ath. 1903, 1:559; Sat. R. 95:590; Nation, 76:476

PHILOSOPHY

- 133.9 Podmore, Frank.** Modern Spiritualism: A History and a Criticism. 2v. Scribner \$5 n
- 3-5164** Likely to become the standard work on the subject. He is the most sceptical of psychical researchers, and possesses extensive and firsthand acquaintance with the evidence. Nation, 76:158
Dial, 34:79; Sat. R. 95:110; Spec. 90:216
- 134 Myers, F. W. H.** Human Personality and its Survival of Bodily Death. 2v. (42/n) Longmans \$12 n
- 3-3539** Exhaustive array of the phenomena of genius, sleep, hypnotism, sensory automatism, phantasms of the dead, motor automatism, trance, possession and ecstasy, with elaborate argument to prove that personality survives death. Acad. 64:197; Critic, 42:461 (J. W. Chadwick), Sat. R. 95:424; Spec. 90:373

ETHICS

- 171 **Keller, Helen.** Optimism: an Essay. Crowell 75c n
 3-30975 Three brief chapters embodying the cheerful and hopeful philosophy of the afflicted but brave young author.
- 177 **c Bell, Mrs Hugh.** The Minor Moralist.
 (Bell 4/6 n) Longmans \$1.60 n
- 3-15146 Essays, characterized by good sense and lightened by touches of humor, on good manners, making a success of middle life, relations of mothers and daughters, beginning life with high ideals, merits and demerits of thrift, lot of the servant.
 Acad. 64:246; Spec. 90:366

RELIGION

- 221 **c McFadyen, J: E.** Old Testament Criticism and the Christian Church. Scribner \$1.50 n
- 3-12775 Book about criticism, not critical book about Bible. Tries to show what criticism is, that it in no way imperils faith but rather helps to bridge gulf between faith and reason.
 Outlook, 74:431; Acad. 65:411
- 221.95 **Pinches, T. G.** Old Testament in the Light of Historical Records and Legends of Assyria and Babylonia. Ed. 2 enl. (S. P. C. K. 7/6) Young \$2.50 n
- Presents facts as recorded in cuneiform and hieroglyphic inscriptions side by side with Bible accounts, with no discussion and little expression of opinion. Popular, 16 plates.
 Ath. 1903, 1:267
- 230 **Gordon, G: A.** Ultimate Conceptions of Faith. Houghton \$1.30 n
- 3-21733 Comprehensive statement of the working theology of a foremost representative of liberal orthodoxy. Mainly Yale lectures.
 Dial, 35:415
- 240 **Peabody, F. G.** The Religion of an Educated Man. Macmillan \$1 n
- 3-27912 Lectures at Haverford College. (1) Religion as Education. (2) Message of Christ to the Scholar. (3) Knowledge and Service.
- 267.613 **Clark, F. E:** Christian Endeavor Manual. United Society of Christian Endeavor \$1
- 3-8670 By founder of Christian Endeavor Society. Covers its history, principles, theories and practice in various channels of work. Bibliography and appendixes.
- 268 **b Mead, G: W.** Modern Methods in Sunday-school Work. Dodd \$1.50 n
- 3-27915 Has collected from current life and progressive work of modern Sunday schools their own account of their administrative methods, collating, presenting and explaining the essential details of various successful plans.
 Burton and Mathews's *Principles and Ideals for the Sunday School*, Univ. of Chicago pr. \$1 n., deals less with specific plans, discussing aims, methods and ideals in connection with work of teacher and pastor.

- 289.9 Elkinton, Joseph.** The Doukhobors, their History in Russia, their Migration to Canada. Ferris \$2
- 3-4773** Account by a Quaker sympathizer of the persecuted Russian "Spirit Wrestlers" and the peculiar religious beliefs which affect their citizenship. Numerous photographic illustrations. Nation, 76:382; Acad. 65:231; Ath. 1904, 1:204
- 296 Joseph, Morris.** Judaism—as Creed and Life. (5/n) Macmillan \$1.60 n
- 4-5976** Bk 1, Beliefs; bk 2, Ceremonial; bk 3, Moral Duties. A view of Judaism midway between strict orthodoxy and extreme liberalism. The latter is represented in Montefiore's *Liberal Judaism*, Macmillan \$1.25. The author of the latter says: "Written in the hope that it may render spiritual service to many who are uncertain whether, or how far, they are still Jews." Montefiore, Acad. 64:247; Spec. 90:824
- 296 c Rosenau, William.** Jewish Ceremonial Institutions and Customs. Friedenwald Co. \$1.50
- 3-4774** Usage and significance in synagogue services, home customs, feasts, fasts, circumcision, marriage, divorce, ritualistic slaughtering, etc. Photographs of utensils, ceremonial robes, etc. Ath. 1903, 2:580; Nation, 76:355

SOCIOLOGY

See also Juvenile, p. 449 and New editions, p. 455

- 301 Tarde, Gabriel.** Laws of Imitation. Holt \$3 n
- 3-24233** Translation of scholarly French study of social structure published 13 years ago. Based on fundamental thesis that "society is imitation" and "began on the day when one man first copied another." Annals of Amer. Acad. 23:360; Lit. W. 35:38
- 304 c Morison, G: S.** The New Epoch as Developed by the Manufacture of Power. Houghton 75c n
- 3-28151** Fundamental idea, that the present age marks the beginnings of a great ethical period to embody distinct advance and change in human civilization. Full of interest and suggestion. Nation, 78:38
- 323 c Hadley, A. T.** Freedom and Responsibility. (Yale Lectures on the Responsibilities of Citizenship) Scribner \$1 n
- 3-31885** Argues that relation between political privileges and moral responsibilities of free citizenship is vital, and that legal or social theories which ignore this are likely to prove destructive. Pittsburgh
- 325.26 a Du Bois, W: E: B.** Souls of Black Folk. McClurg \$1.20 n
- 3-11173** Contends for the spiritual uplifting of the negro as the necessary complement of Mr Washington's practical and material theories. Professor Du Bois is perhaps the most scholarly man of his race in America. Dial, 34:300
Acad. 65:103; Nation, 76:481; Outlook, 74:214

- 327.73 c Foster, J: W.** American Diplomacy in the Orient.
Houghton \$3 n
- 3-4448** Taken in connection with his *Century of American Diplomacy* constitutes first systematic attempt to present a clear and concise discussion of questions of foreign policy arising out of our relations with countries of Far East. *Annals of Amer. Acad.* 22:221
Texts of treaties and protocols in appendix.
Amer. Hist. R. 9:180 (T. S. Woolsey); Dial, 35:34; Lit. W. 34:115
- 329 Woodburn, J. A.** American Republic and its Government.
Putnam \$2 n
—— Political Parties and Party Problems in the United States.
Putnam \$2 n
- 3-4763** Form together a treatment of civil government in this country,
3-9361 both theoretical and historical. The declared aim was to prepare a work intermediate between the elementary textbook and the comprehensive treatises of Bryce and Ostrogorski. *Dial*, 34:378
Nation, 76:437, 77:339; Lit. W. 34:115, 206
- 330 a Brooks, J: G.** The Social Unrest. Macmillan \$1.50 n
Special ed. pap. 25c
- 3-1440** He has divested himself to an unusual degree from bias and class prejudice, and, on terms of familiarity and intimacy with leaders of both capital and labor, writes from fullness of experience.
Ath. 1903, 1:680; Dial, 34:233; Polit. Sci. 2, 18:343; Atlantic, 91:569 (J. H. Gray)
- 331.4 b Van Vorst, Mrs Bessie & Van Vorst, Marie.** The Woman Who Toils. Doubleday \$1.50 n
- 3-4201** Authors studied life of working women by sharing it in a Pittsburgh pickle factory, a southern cotton mill, a Lynn shoe factory, making clothing in Chicago, etc.
Ath. 1903, 2:218; Critic, 42:375 (O. H. Dunbar); Dial, 34:402; Nation, 77:39
- 331.87 c Mitchell, John.** Organized Labor, its Problems, Purposes and Ideals.
Amer. Book & Bible House \$1.75 n
- 3-27926** Partizan in discussion of nearly every subject, despite indications that he strives to be fair-minded. However, he holds high ideals before the laboring class. *Annals of Amer. Acad.* 23:546
Lit. W. 34:339
- 336.73 Dewey, D. R.** Financial History of the United States.
(Amer. Citizen Ser.) Longmans \$2
- 3-4764** From colonial period to present. Historical, not didactic and eminently fair in presenting various sides. Annotated bibliographies and 18 graphic charts.
Jour. of Polit. Econ. 2:487; Dial, 35:311; Nation, 77:121
- 338.8 Meade, E: S.** Trust Finance. (Appleton's Business Ser.)
Appleton \$1.25 n
- 3-11174** Study of the genesis, organization and management of industrial combinations.
Extended examination of the United States Steel Corporation of particular interest. *Jour. of Polit. Econ.* 12:156
Dial, 35:44; Nation, 77:191

- 352.0747 Hodder, Alfred.** A Fight for the City.
Macmillan \$1.50 n
- 3-12528** Account of William Travers Jerome's campaign (1901) for office of district attorney for New York county. First published in *Outlook*.
Nation, 77:12; Dial, 35:129
- 353.7 Long, J: D.** The New American Navy. 2v.
Macmillan \$5 n
- 3-31878** Short sketches of navy from Civil War to early eighties, history of new development and account of recent exploits and present condition.
Lit. W. 35:39; Nation, 78:52
- 364 c Booth, Mrs Maud Ballington.** After Prison—What?
Revell \$1.25 n
- 3-25751** Describes her personal work among prisoners and the results which have followed the methods advocated.
Annals of Amer. Acad. 23:349; Bookman, 18:645; Nation, 77:533
- 385 Johnson, E. R.** American Railway Transportation.
(Appleton's Business Ser.) Appleton \$1.50 n
- 3-20360** Describes existing system, discussing questions connected with ownership, management, monopoly and competition, rates, fares, relations with state, etc. Semi-popular. Bibliographic references.
Meyer's *Railway Legislation in the United States* (Citizen's Lib. of Economics and Politics). Macmillan \$1.25 n., gives condensed analysis of private and public laws governing railways and of important decisions affecting interstate commerce.
Johnson, Nation, 77:531; Dial, 36:391; Meyer, Annals of Amer. Acad. 22:345; Dial, 36:393

EDUCATION

- 371.42 Baldwin, W: A.** Industrial-social Education.
Milton Bradley Co. \$1.50
- 3-26889** Describes work being done at Hyannis Mass. with discussion of pedagogic reasons; chapters on weaving, raphia, rattan and splint baskets, hammock making, school gardens, sewing etc. Fully illustrated.
- 372.1 Buck, Winifred.** Boys' Self-governing Clubs.
Macmillan \$1 n
- 3-11651** Manual suggesting methods for organizing and conducting boys clubs; based on 12 years' experience. Interesting chapter on criminal acts in children.
Spec. 90:944
- 373.73 Adams, O. F.** Some Famous American Schools.
Estes \$1.20 n
- 3-19852** Popular papers on boys' schools—Nazareth Hall, Phillips Andover, Phillips Exeter, Lawrenceville, St Paul's, St Mark's, Shattuck, Groton and Belmont Nearly 50 photographic illustrations.
- 379.11 a Eliot, C: W.** More Money for the Public Schools.
Doubleday \$1 n
- 3-10062** Sums up benefits and shortcomings of present public education and urges need of fireproof and sanitary buildings, attractive school yards, medical inspection, pensions, improved curriculums, better equipped teachers, etc.
Dial, 35:93; Nation, 77:173

CUSTOMS AND FOLKLORE

See also Juvenile, p. 450

- 391 *c Earle, Mrs Alice (Morse).* Two Centuries of Costume in America, 1620-1820. 2v. Macmillan \$5 n
- 3-31011 Alive with gossip and anecdote of the time, with abundance of illustration, it is an invaluable book of reference for every detail of dress from 1620 to 1820.
Ath. 1904, 1:263; Dial, 36:46; Nation, 78:55; Spec. 92:336

NATURAL SCIENCE

See also Juvenile, p. 450 and New editions, p. 455

- 507 *b Bailey, L. H.* The Nature-study Idea. Doubleday \$1 n
- 3-10055 Explains purpose and indicates spirit and methods which should prevail in putting children in touch with nature. Does not outline courses or give specific directions.
Critic, 43:168 (D. L. Sharp); Dial, 34:405
- 523.13 *Wallace, A. R.* Man's Place in the Universe. McClure \$2.50 n
- 4-21 Considers evidence for or against the probable existence on other worlds of such organic life, specially human, as is found on the earth. *Dial*, 36:148
Nation, 78:34; Spec. 92:54
- 546 *Hammer, W: J.* Radium and other Radio-active Substances. Van Nostrand \$1
- 3-16267 Most complete work on subject. (1903) Deals with radium, polonium, actinium, thorium, phosphorescent and fluorescent substances, applications of selenium, and treatment of diseases by ultra-violet light. Bottone's *Radium and All about It*, Whittaker, 35c n., is much more popular, treating of scientific aspects only, not practical applications.
Nation, 78:211
- 551 *Partsch, J. F. M.* Central Europe. (Appleton's World Ser.) Appleton \$2 n
- 3-25895 Includes German empire, Austro-Hungary, the Balkans, Switzerland. Treats physical features in detail and points out influence on national life and political and economic development.
Ath. 1903, 2:488; Acad. 64:583
- 575 *Metchnikoff, Elie.* The Nature of Man: Studies in Optimistic Philosophy. Putnam \$2 n
- 3-26337 Elaborates the idea of functional harmonies and disharmonies with special consideration of influence on old age and death.
Addressed to disciplined minds and in especial, to the biologist.
Preface
Amer. Jour. of Soc. 9:580 (A. W. Small); Dial, 36:329 (A. K. Rogers); Nation, 78:56; Sat. R. 96:802
- 581.61 *Snow, C: H.* The Principal Species of Wood: their Characteristic Properties. Wiley \$3.50
- 3-9910 Primarily intended for workers in wood. Gives general description of each genus, with full page plate generally showing detail of bark, leaf and wood, as well as general tree form. For each species is given scientific and various local names, locality, general features, color and appearance of wood, structural qualities, representative uses, weight etc. Describes about 125 species. 39 plates.
Nation, 76:417

- 581.973 c Keeler, H. L.** *Our Northern Shrubs and How to Identify Them.* Scribner \$2 n
- 3-11679 Popular guide on same general plan as her *Our Native Trees*. Each of 230 species analyzed scientifically and described popularly with special reference to its origin, history, hardihood and decorative possibilities. 205 plates from photographs, 35 drawings. Critic, 43:166 (D. L. Sharp); Dial, 34:367; Lit. W. 34:143
- 587.3 c Waters, C. E.** *Ferns: a Manual for the Northeastern States.* Holt \$3 n
- 3-20407 For amateur botanists. Outcome of 14 years' field study. Provides a system of identification based on stem structure as well as that based on fructification. Remarkably beautiful and instructive collection of fern photographs. Too heavy for field use. Dial, 36:122; Nation, 77:382
- 589.95 Conn, H. W.** *Bacteria, Yeasts and Molds in the Home.* Ginn \$1
- 3-32453 For practical housekeepers and students of household economics. Deals with beneficent and destructive growths, conditions of production, preservation processes, control of contagion, etc.
- 591.5 b Bostock, F. C.** *Training of Wild Animals.* Century \$1 n
- 3-16266 By experienced trainer. Dwells on animal traits in captivity and hazardous lives of trainers, rather than details of methods of training for show ring. Nation, 77:135
- 591.5 b Long, W. J.** *A Little Brother to the Bear, and other Animal Studies.* Ginn \$1.50 n
- 3-27981 Observations and inferences wrought into excellent tales of bears, coons, woodcock, toads, wildcats, moose and other wild creatures. Attractively illustrated. Acad. 65:650; Dial, 35:468; Nation, 77:489
- 591.5 Walton, M. A.** *A Hermit's Wild Friends.* Estes \$1.50 n
- 3-25738 Animal lore and woodcraft. Author somewhat widely known as the hermit of Gloucester. Illustrated. Dial, 35:468
- 595.7 c Comstock, A. B.** *Ways of the Six-footed.* Ginn 40c
- 3-13361 On mosquitos, katydids, wasps, moths, ants and other common insects. Of value and interest as observations and attractive in literary quality and illustration. For adults, primarily.
- 595.78 Holland, W. J.** *The Moth Book.* Doubleday \$4 n
- 3-31233 Popular, compact descriptions of peculiar features, habits and distribution of North American species. 48 colored plates and 263 text illustrations. Introductory chapters on life history, anatomy, capture, preservation and classification. Bibliography. Nation, 78:117; Dial, 36:41; Science, 19:188 (L. O. Howard)
- 598.2 c Chapman, F. M.** *Color Key to North American Birds.* Doubleday \$2.50 n
- 3-31958 Systematic list of birds with over 800 sketches, diagrammatic rather than lifelike, indicating characteristics and color of birds when seen at a distance, with brief notes to aid identification. Includes species and subspecies from Panama to the Pole. Nation, 78:111

- 598.2 *a* **Weed, C. M. & Dearborn, Ned.** Birds in their Relations to Man: a Manual of Economic Ornithology.

Lippincott \$2.50 n

- 3-14872 Discusses kind and quality of food, animal and vegetable, consumed by various species. Chapters on conservation and prevention of depredations. Annotated bibliography; illustrations.

Dial, 35:128; Lit. W. 34:170; Nation, 77:136

USEFUL ARTS

See also Juvenile, p. 451

- 613.7 *b* **Benson, E. F. & Miles, E. H.** Daily Training. (Athletic Lib.) Dutton \$1.50 n

- 3-16363 Concerning exercise, diet, stimulants, water, heat, sleep, rest etc. under ordinary conditions. Thoroughly manly and practical. The joint authors agree on broad principles, though differing widely in personal practices.

Ath. 1903, 1:179; Nation, 76:331

- 613.7 *c* **Hancock, H. I.** Japanese Physical Training.

Putnam \$1.25 n

- 3-32598 Describes "Jiu-Jitsu," the system of exercises for acquiring strength and skill in self-defense, and Japanese habits as to diet, fresh air, use of water, etc. Photographic illustrations.

Acad. 66:246; Dial, 36:302; Nation, 78:135

- 613.81 **Billings, J. S. ed.** Physiological Aspects of the Liquor Problem. 2v. Houghton \$4.50 n

- 3-14025 4th subreport to committee of 50. Concludes that use of alcohol impairs mental work, lessens physical power, does not protect against cold and fatigue and diminishes resistance to infectious diseases. Condemns and exposes fallacy of some misdirected efforts to promote temperance.

Nation, 77:52

- 616.246 *c* **New York Charity Organization Society.** Handbook on the Prevention of Tuberculosis.

N. Y. Charity Organization Society \$1 n

This book, prepared by specialists, is a magazine of information, in plain terms and for practical use, concerning evils to be eradicated, dangers to be guarded against and curative methods (not medical treatment) to be practised. Every town improvement society should be familiar with it, and families shadowed by consumption should have its help. It points to a day when this scourge shall be driven out.

- 619 **Mayo, N. S.** Care of Animals. (Rural Science Ser.) Macmillan \$1.25 n

- 3-32828 Brief, popular advice on diseases and ailments of farm animals with directions about general care, quarters, care of pets, and judging, handling and shoeing horses.

Ath. 1904, 1:367; Nation, 78:130

- 630.2 **Burkett, C. W.; Stevens, F. L. & Hill, D. H.** Agriculture for Beginners. Ginn 75c

- 3-18728 Illustrated school manual. Treats of soil, plant growth, cross breeding, plant diseases and pests, domestic animals, dairying. Similar in scope, less fully illustrated, with chapters on wind and weather, is Bessey, Bruner and Swezey's *New Elementary Agriculture for Rural and Graded Schools*, Univ. Pub. Co. Lincoln Neb. 60c.

Sat. R. 97:24

- 634** *c* **Hemenway, H. D.** How to Make School Gardens. Doubleday \$1 n
 3-13729 Illustrated manual for teacher and pupil. Gives in the form of daily lessons, explicit directions for young pupils. Author director of Hartford School of Horticulture. Bibliography. Nation, 76:523
- 639** **Laut, A. C.** Story of the Trapper. (Story of the West Ser.) Appleton \$1.25 n
 2-28285 Sketches efforts of rival companies to control American fur field, describes trapper's daring and picturesque life, the wilderness training and the ways of beasts. Dial, 34:244; Nation, 76:39
- 640** **Clark, T. M.** Care of a House. Macmillan \$1.50 n
 3-22845 Volume of suggestions by an architect to householders, house-keepers, landlords, tenants, trustees and others for the economical and efficient care of dwelling houses. Acad. 65:470; Ath. 1904, 1:86; Nation, 77:491
- 647** **Pettengill, Lillian.** Toilers of the Home. Doubleday \$1.50 n
 3-22107 Detailed and gossip record of a college woman's experiences as domestic servant in five families within nine months. Presents no new conclusions but offers food for thought. Annals of Amer. Acad. 23:358; Nation, 78:334
- 652** **Altmaier, C. L.** Model Type-writing Instructor. Schoch \$1
 3-21742 Handbook by teacher in Drexel Institute, with instruction as to touch, manipulation of machine, arrangement of material, etc. Includes drills for civil service examinations. Printing imitates type-written work.
- 659** **Scott, W. D.** Theory of Advertising. Small \$2 n
 3-32836 Illustrated study of psychologic values in advertisements. A practical aid to advertisers and interesting to many general readers.
- 680** **Hopkins, G. M.** Home Mechanics for Amateurs. Munn \$1.50
 3-26920 (Scientific Amer. Ser.) Wood-working, how to make household ornaments, metal-working, model engines and boilers, meteorology, telescopes and microscopes, electricity. Appeared in part in *Scientific American*.

FINE ARTS

See also Juvenile biography, p. 452

- 710** *b* **Robinson, C. M.** Modern Civic Art. Putnam \$2.50 n
 3-13052 Practical, stating general principles, and applying to specific problems of convenience and beauty which confront cities. Critic, 43:283; Lit. W. 34:211
- 716** *b* **Ely, H. R.** A Woman's Hardy Garden. Macmillan \$1.75 n
 3-3845 Remarkably practical, written from experience and exact in information. Many dated photographs taken in author's garden, 70 miles from New York. *How to Make a Flower Garden*, Doubleday \$1.60 n., a handsome quarto, consists of over 50 papers by various writers, with 100 beautiful photographic illustrations. Dial, 34:360; Nation, 76:293

- 716.2 Weed, C. M.** *The Flower Beautiful.* Houghton \$2.50 n
 3-12301 Arrangement of flowers and their decorative value indoors. Considers relation (1) to each other, (2) to the receptacle, (3) to the environment. Beautifully illustrated and printed. Dial, 34:361; Lit. W. 34:229; Nation, 77:271
- 720 a Sturgis, Russell.** *How to Judge Architecture.* Baker & T. \$1.50 n
 3-27974 Attempts to assist layman to better appreciation of the qualities which raise a building into the domain of the fine arts. *Nation*, 77:490
 Abundant illustrations. Dial, 36:161; Lit. W. 34:353
- 720.738 Anderson, W: J. & Spiers, R. P.** *Architecture of Greece and Rome.* (Batsford 18/n) Scribner \$7.50 n
 3-7766 Sketch of development. Popular, trustworthy, without effort to urge special theory, amply illustrated. Written out of full knowledge but neither very well ordered nor free from repetitions. 179 excellent illustrations. Ath. 1903, 1:472; Nation, 76:215; Spec. 90:157
- 726.6 Miltoun, Francis.** *Cathedrals of Northern France.* Page \$1.60 n
 3-28875 In spite of shortcomings, a useful handbook for travelers having a not too profound interest in church architecture and history. Not so valuable for home study as Wilson's *Cathedrals of France*, Churchman Co. \$3, with over 200 illustrations from photographs. Nation, 77:484
- 733 Murray, A. S.** *Sculptures of the Parthenon.* (Murray 21/n) Dutton \$6.50 n
 3-16536 Brings together a series of photographic reproductions, small but clear and adequate, which include nearly everything still extant, supplemented by Carrey's drawings, made in 17th century, of those since destroyed. Text mainly for artist and general reader, but often suggestive even to special student of archeology. *Ath.* 1903, 2:259
 Mach's *Greek Sculpture*, Ginn \$4.50, addressed to students of art, executing artists and general reader, treats of spirit and principles in familiarly instructive manner. Many halftone plates. Author intends to issue collection of about 500 reproductions of statues and reliefs in uniform size for use in further illustration. Murray, Atlantic, 93:413; Nation, 77:121
- 735 c Taft, Lorado.** *History of American Sculpture.* (History of Amer. Art) Macmillan \$6 n
 3-30499 Treats in chronologic order all our sculptors, famous and obscure, down to men still living, and avoids too enthusiastic or too severe a tone. *Atlantic* 93:411
 12 photogravures, 104 halftones. Nation, 77:487; Dial, 36:150
- 738 c Moore, Mrs N. H.** *Old China Book: including Staffordshire, Wedgwood, Lustre and other English Pottery and Porcelain.* Stokes \$2 n
 3-13375 Mainly old English wares found in America. Profuse illustration, description, historical notes, value, lists of local views, etc. Dial, 35:94; Nation, 77:51

- 740** **c Kelley, L. E.** *Three Hundred Things a Bright Girl can Do.* Estes \$1.20 n
- 3-29591 Instruction in bead, worsted and thread work, joinery, wood-carving, pyrography, basketry, rug making, clay modeling, paper flowers, athletics, taxidermy, bee keeping, suggestions for entertainments, girls clubs, etc.
- 745** **Day, L. F.** *Pattern Design.* (Batsford 7/6 n) Scribner \$3 n
- 4-7318 For students, treating in a practical way of the anatomy, planning and evolution of repeated ornament. Supersedes his *Anatomy of Pattern*. Fully illustrated. Nation, 78:69
- 745** **Wilson, V. T.** *Free-hand Lettering.* Wiley \$1
- 3-29281 Treatise on plain lettering from the practical standpoint for use in engineering schools and colleges. Illustrated.
L. F. Day's *Lettering in Ornament*, Scribner \$2 n., is an amply illustrated study of the decorative use of lettering, past, present and possible; it follows his *Alphabets, Old and New* (1899), which deals only with forms of letters, not their ornamental application in art. T. C. Brown's excellent *Letters and Lettering* (1902) deals with various matters treated more fully in these volumes, and would perhaps be the best *single* designer's handbook if library could buy but one.
Wilson, Engineering Record, 49:32; Day, Nation, 76:292
- 749** **c Wheeler, Mrs Candace (Thurber).** *Principles of Home Decoration.* Doubleday \$1.80 n
- 3-4677 Deals with theory and specific applications, art being understood to imply both appropriateness and beauty. Nation, 77:158
- 750** **Van Dyke, J. C.** *Meaning of Pictures.* Scribner \$1 n
- 3-4678 Columbia University lectures at Metropolitan Museum. Aims to train popular understanding to nicer and more intelligent appreciation. Suggestive, not didactic. 30 excellent reproductions illustrate text. Deals less definitely with specific pictures and schools than Witt's *How to Look at Pictures* (1902), being concerned with them rather as illustrating principles. Nation, 76:500; Dial, 34:406
- 759.1** **Way, T. R. & Dennis, G. R.** *Art of James McNeill Whistler.* (Bell 10/6 n) Macmillan \$3 n
- 4-487 No adequate treatment of Whistler has yet appeared. This volume deals almost solely with his art, is illustrated by over 50 halftones and has temporary value. *Recollections and Impressions of James A. McNeill Whistler* by A. J. Eddy, Lippincott \$2 n., is a collection of anecdotes and miscellaneous data by an extravagant admirer, with 12 excellent plates.
Way, Atlantic, 93:412; Sat. R. 97:120; Eddy, Ath. 1904, 1:312; Nation, 77:486; Dial, 36:110
- 759.4** **Mauclair, Camille.** *French Impressionists, 1860-1900.* (Popular Lib. of Art) (Duckworth 2/n) Dutton 75c n
- 3-16538 Discusses theory of impressionism, with critical estimates of work of Manet, Degas, Claude Monet, Renoir, and briefer mention of many other impressionists and neoimpressionists. 50 halftones. Dial, 35:176; Nation, 76:499; Ath. 1903, 1:727

MUSIC

- 780.3 Hughes, Rupert, ed.** *The Musical Guide.* 2v.
McClure \$6 n
- 3-26388 Contains a pronouncing and defining dictionary of terms, instruments etc., a biographic dictionary of musicians, stories of leading operas, short, signed critical or explanatory essays and paragraphs by authorities, charts, illustrative passages, etc. Useful reference book for libraries which can not afford the expensive works of Grove or Champlin and Apthorp.
Lit. W. 35:14
- 780.7 b Lavignac, Albert.** *Musical Education.* (Appleton's Musical Ser.)
Appleton \$2 n
- 3-11513 Takes up almost every question which confronts parents in connection with a child's musical training and gives practical advice in clear and even entertaining language.
Nation, 76:520; Dial, 35:42; Critic, 43:191

AMUSEMENTS AND SPORTS

- 793 c White, Mary & Sara.** *Book of Children's Parties.*
Century \$1 n
- 3-26321 For parents and guardians. Describes great variety of games and entertainments appropriate to each season. Suggests favors and menus. Illustrated.
Nation, 77:449
- 796 Athletics and Outdoor Sports for Women;** with an introduction by L. E. Hill. Macmillan \$1.50 n
- 3-11989 Chapters by specialists on physical training, gymnasium work, dancing, cross-country walking, skating, rowing, golf, running, tennis, hockey, basketball, equestrianism, fencing, bowling, track athletics. Illustrated. Introduction by director of physical training at Wellesley.
Nation, 76:416

POETRY

See also Juvenile, p.451

- 811.49 c Lewis, C. M.** *Gawayne and the Green Knight: a Fairy Tale.*
Houghton \$1 n
- 3-23867 An agreeable reversion to a type of poetry now little cultivated. There is no mysticism here and there is a great deal of humor. It belongs to that school of English poetry of which the first and greatest is Chaucer. *Atlantic*, 93:121
- 811.49 Peabody, J. P.** *The Singing Leaves.* Houghton \$1 n
- 3-29648 A little book of little songs wherein many childish dreams and fancies, graceful, tender and altogether alluring, find expression.
Nation, 77:487; Dial, 35:476; Atlantic, 93:119
- 811.49 Woodberry, G. E.** *Poems.* Macmillan \$1.50 n
- 3-29822 Includes earlier volumes, *My Country*, *Wild Eden*, *Players' Elegy*, *North Shore Watch*, *Odes and Sonnets*, with some hitherto unpublished verse.
Nation, 77:488; Dial, 36:198

- 821.89 b Kipling, Rudyard.** *The Five Nations.* Doubleday \$1.40 n
3-24544 Old and new poems including *The Sea and the Hills*, *White Horses*, *The Feet of the Young Men*, *Truce of the Bear*, *The Palace*, *White Man's Burden*, *Our Lady of the Snows*, *The Lesson*, *Islanders*, *Piet*, *Boots*, *Recessional*, etc.
 Acad. 65:319; Dial. 35:355; Nation, 77:387; Ath. 1903, 2:474

DRAMA

- 812.49 Cameron, Mrs Margaret.** *Comedies in Miniature.* McClure \$1.30 n
3-23877 11 light parlor plays, dialogues and monologues, easily set. Characters mostly women.
- 822.29** { **Everyman: a Moral Play.** - Fox, Duffield \$1
 { **Everyman: a Morality Play;** ed. with an introd. by M. J. Moses. J. F. Taylor \$1
3-9614 The Fox, Duffield edition imitates old prints with cream laid paper and illustrations from 16th century edition, but uses modern spellings. The Taylor edition devotes 80 pages to introduction, notes and bibliography, gives text in old spellings and is illustrated from 12 photographs of modern stage settings.
3-27494 Fox, Nation, 76:314; Taylor, Lit. W. 35:43
- 822.8 Mackaye, Percy.** *The Canterbury Pilgrims: a Comedy.* Macmillan \$1.25
3-8333 An acting play in blank verse, the characters being Chaucer and the Canterbury pilgrims.
 Lit. W. 34:124; Nation, 76:480

ESSAYS, HISTORY OF LITERATURE, ETC.

See also New edition, p.455

- 810.9 c Trent, W: P.** *History of American Literature, 1607-1865.* (Short Histories of the Literatures of the World) Appleton \$1.40 n
3-15003 Excellent outline, packed with historical facts, critical evaluations, names and titles, deftly combined and discussed in an interesting style. Higginson's *Reader's History of American Literature*, Houghton \$1.25 n., based on Lowell lectures and rich in personal reminiscence, is less comprehensive, but more readable; Woodberry's *America in Literature*, Harper \$1.50 n., consists of seven essays treating chronologic or sectional groups, but forming a critical estimate rather than a history.
 Trent, Bookman, 18:414 (Richard Burton); Dial. 35:175; Nation, 77:251; Higginson, Dial. 35:314; Nation, 78:136; Woodberry, Acad. 66:13; Lit. W. 35:13; Nation, 78:18
- 814.49 b Aldrich, T: B.** *Ponkapog Papers.* Houghton \$1 n
3-26157 Brief essays, notebook paragraphs, occasional bits of verse and an appreciation of Robert Herrick. Exquisite in wit and expression.
 Dial. 35:359; Nation, 77:509
- 814.49 Brown, W: G.** *Foe of Compromise, and other Essays.* Macmillan \$1.50 n
3-28575 Other essays: *A Defence of American Parties*; *The Task of the American Historian*; *Great Occasions of an American University*.
 Nation, 78:50; Dial. 36:323

- 814.49 b Buckham, James.** Where Town and Country Meet. Jennings \$1 n
 3-11256 He writes about what he sees along the paths from his back door to his various fishing holes. *Critic*, 43:167 (D. L. Sharp)
 He uses the five senses and the sixth sense of sympathy, and does not bother with field glasses, or microscopes and technicalities. *Lit. W.* 34:149
Dial, 34:365
- 814.49 Chesterton, G. K.** Varied Types. Dodd \$1.20 n
 4-14141 On Charlotte Brontë, William Morris, Pope, Rostand, Stevenson, Tolstoy, Bret Harte, Alfred the Great, Queen Victoria, the German Emperor, Tennyson, etc. Reprinted from London newspapers. *Critic*, 43:572; *Nation*, 77:509
- 814.49 a Crothers, S: McC.** The Gentle Reader. Houghton \$1.25 n
 3-25285 11 delightfully humorous and genial essays that suggest Charles Lamb and Oliver Wendell Holmes. *Pittsburgh*
 Mainly reprinted from the *Atlantic*. *Critic*, 44:557; *Dial*, 35:360
- 814.49 Mabie, H. W.** Backgrounds of Literature. Macmillan \$2 n
 3-26146 Wordsworth, Emerson, Irving, Goethe, Blackmore, Whitman and Scott are treated in essays generally combining analysis of work with description of environment. Beautifully illustrated. *Nation*, 78:198; *Dial*, 35:425
- 814.49 c Torrey, Bradford.** Clerk of the Woods. Houghton \$1.10 n
 3-22540 Brief papers which chronicle outdoor affairs from May to April. Reprinted from *Boston Transcript* and *New York Mail and Express*. Here is a prose poet who has the grace of walking and talking at the same time. *Dial*, 35:467
Nation, 77:361
- 818.4 Owen, Belle.** A Prairie Winter. Macmillan \$1 n
 3-8906 Record of quiet country life, by an Illinois girl alert to natural beauty and the charms of simple living. *Lit. W.* 34:126; *Critic*, 43:167 (D. L. Sharp)
- 818.4 b White, S. E:** The Forest. Macmillan \$1.50 n
 3-27957 Woodcraft, camper's lore, character sketches, description and analysis of the charm of out of doors, held together by the experiences of a canoe trip through the woods of Canada and northern Michigan. Illustrated. Bookman, 18:299; *Nation*, 77:430; *Lit. W.* 34:349; *Spec.* 92:257
- 820.9 Garnett, Richard & Gosse, E. W.** English Literature: an Illustrated Record. 4v. (Heinemann each 16/n) Macmillan each \$6 n
 4-1596 v. 1, From the beginnings to the age of Henry 8; v. 2, Henry 8 to Milton; v. 3, Milton to Johnson; v. 4, Johnson to Tennyson. The abundance and excellence of the illustrations, including facsimiles of manuscripts, autographs, engravings, title-pages, portraits, views of places, buildings, etc. give it a quite peculiar value. *Nation*
 Volumes sold separately. *Nation*, 77:59, 78:177; *Dial*, 35:5, 36:158; *Spec.* 91:205; *Ath.* 1903, 2:113, 1904, 1:424

- 823.83** *c* **Ward, H. S. & C. W. (Barnes).** The Real Dickens Land. (Chapman 10/6 n) Lippincott \$3.50 n
 4-1916 Lovingly traces footsteps of novelist and his characters, in England. Fine photographs of associated buildings and scenes are reproduced on nearly every page. The full index goes beyond the book's actual content in providing a condensed directory to Dickens land.
 Ath. 1903, 2:582; Sat. R. 96:680
- 824.89** **Paget, Violet,** "Vernon Lee" *pseud.* Hortus Vitae; or, The Hanging Garden. (3/6 n) Lane \$1.25 n
 Short essays of distinctly literary quality on Reading Books, Against Talking, On Going to the Play, The Blame of Portraits, Making Presents, etc.
 Acad. 65:493; Ath. 1904, 1:48; Spec. 92:161
- 824.89** **Yeats, W: B.** Ideas of Good and Evil. Macmillan \$1.50 n
 3-28146 Short essays on poetry, magic, William Blake, symbolism in painting and poetry, the theater, Ireland and the arts, the Celtic element in literature, etc.
 Nation; 77:52; Acad. 64:589; Ath. 1903, 1:807
- 828.8** **Phillipotts, Eden.** My Devon Year. Macmillan \$2
 4-2650 Series of nature pictures written in prose which is sometimes near poetry. *Athenaeum* 1904, 1:8
 38 chapters rarely exceeding six pages, independent but chronologically arranged, and each accompanied by an illustration.
 Acad. 65:531; Spec. 92:157
- 851** **Kuhns, Oscar.** Great Poets of Italy. Houghton \$2 n
 3-28120 The poets most fully represented are Dante, Petrarch, Ariosto, Tasso, Alfieri, Leopardi and Carducci. Forms a tolerably consecutive history of Italian poetry. 12 excellent portraits; copious extracts in translations almost invariably good. *Nation*, 77:485
 Dial, 35:418 (W. M. Payne)

DESCRIPTION AND TRAVEL

See also Juvenile, p. 451 and New editions, p. 455

- 911.73** *c* **Semple, E. C.** American History and its Geographic Conditions. Houghton \$3 n
 3-26624 Study of the dominant influence of geographic conditions on successive events of American history, and on the great factors of progress, railroads, immigration, distribution of cities, etc. Excellent maps. Brigham's more popular, illustrated *Geographic Influences in American History*, Ginn \$1.25, considers America's development from the geologist's point of view and is of more interest to the geographer than to the student of history.
 Dial, 36:124; Nation, 77:534; Amer. Hist. R. 9:571 (A. B. Hart)
- 913.38** **Gulick, C: B.** Life of the Ancient Greeks: with Special Reference to Athens. (20th Century Text-books) Appleton \$1.40 n
 3-734 Comprehensive handbook, copiously illustrated, by assistant professor of Greek at Harvard. Supplementary tables of references to Xenophon, and sources of illustrations, bibliography and indexes.
 The Private Life of the Romans, by Professor Johnston of Indiana University, Scott, F. & Co. \$1.50 (Lake Classical Ser.), serves a similar purpose for students of Latin authors.
 Nation, 76:362

- 913.38 Richardson, R. B.** Vacation Days in Greece.
(Smith & E. 7/6 n) Scribner \$2 n
- 3-23398 Author lived 11 years in Greece and visited parts rarely seen by travelers. Chapters on Sicily and Dalmatia. Rich both in entertainment and instruction. Maps and illustrations.
Nation, 77:339
- 913.569 c Sanday, William & Waterhouse, Paul.** Sacred Sites of the Gospels. (Frowde 13/6 n) Oxford Univ. (Amer. branch) \$4.50 n
- 3-10937 55 plates from photographs, many elaborate plans and maps with descriptive notes. Text on external aspect of Palestine in time of Christ, sites within and outside Jerusalem, recent literature and the temple of Herod.
Ath. 1903, 2:196; Nation, 77:254; Sat. R. 97:272
- 914 Symons, Arthur.** Cities. Pott \$3
- 4-7865 Impressionist sketches of Rome, Venice, Naples, Seville, Prague, Moscow, Budapest, Belgrade, Sofia, Constantinople. Eight photographs from old pictures.
Acad. 65:437; Ath. 1903, 2:641; Dial, 35:424; Sat. R. 96:674; Atlantic, 93:276
- 914.38 c Brandes, Georg.** Poland: a Study of the Land, People and Literature. Macmillan \$3 n
- 3-25625 "Impressions" written in four sections dated 1885, 1886, 1894, 1899.
Fascinating mixture of history, philosophy, literary criticism and personal experience. *Dial*, 35:169 (*W. M. Payne*)
Ath. 1903, 1:526; Critic, 42:559 (Christian Brinton)
- 914.56 Chandlery, P. J.** Pilgrim-walks in Rome: a Guide to its Holy Places. *The Messenger* \$1.50
- 4-13311 Fairly comprehensive illustrated handbook for Roman catholic pilgrims. Concerned with religious history, legend and local associations rather than secular and archeologic interests.
Nation, 78:37
- 914.7 a Gerrare, Wirt.** Greater Russia. Macmillan \$3 n
- 3-7877 One of the most readable of recent books on Russia. Largely a narrative of personal experience. Neither profound nor comprehensive, but lively and well written. *Pittsburgh*
Views Russian aggressions with alarm. Beveridge's *Russian Advance* Harper \$2.50 n., is a record of travel through Russia and Siberia and is strongly pro-Russian.
Gerrare, Ath. 1903, 1:425; Dial, 35:224; Nation, 76:500; Spec. 90:705; Beveridge, Acad. 66:120; Dial, 36:111; Lit. W. 35:37; Nation, 78:135
- 914.89 c Brochner, Jessie.** Danish Life in Town and Country. (Our European Neighbors)
(Newnes 3/6 n) Putnam \$1.20 n
- 3-13073 Like others of series, sets forth various aspects, social, religious, educational, urban and rural. Excellent halftones really supplement text.
Dial, 36:51; Lit. W. 34:207; Nation, 76:496

- 914.94 Rhodes, D. P.** A Pleasure-book of Grindelwald.
Macmillan \$1.50 n
- 4-708 Region between the Grosse Scheidegg and Mürren. All the pleasures of Alpine life and leisure in winter and summer are here recalled. Good map and many attractive halftones.
Dial, 36:156; Nation, 77:321
- 915.15 Hedin, Sven.** Central Asia and Tibet. 2v.
Scribner \$10.50 n
- 3-33031 Record of journeys in 1899-1901, covering 6000 miles. 428 illustrations, 5 maps.
Clear, simple, graphic, not deficient in human interest. *Nation*, 78:112
Dial, 36:194; Ath. 1903, 2:746; Spec. 92:156
- 915.2 a Clement, E. W.** Handbook of Modern Japan.
McClurg \$1.40 n
- 3-28989 Birdseye view of Japan's characteristics and resources with references to works where abundant information may be found. Illustrations and map.
Dial, 36:25; Nation, 77:528; Ath. 1904, 1:681; Sat. R. 97:365
- 915.2 Gulick, S. L.** Evolution of the Japanese—Social and Psychic.
Revell \$2 n
- 3-15862 Study of Japanese race characteristics, social, mental and moral and of the possibilities of western influence.
Nation, 77:467; Critic, 43:466 (Griffis); Ath. 1903, 2:444
- 915.69 Butler, Elizabeth, lady.** Letters from the Holy Land.
(Black 7/6 n) Macmillan \$3 n
- 3-15131 Series of impressions in colors and in words. There is no book which the tourist would be better advised to take with him were he starting for Palestine for the first time. *Ath.* 1903, 2:214
They breathe the spirit of the devout catholic, but the writer has no narrow exclusiveness in her sympathies. *Sat. R.* 96:5 (*Supplement Oct. 17*)
Acad. 64:339
- 917.12 Stutfield, H. E. M. & Collie, J. N.** Climbs and Explorations in the Canadian Rockies.
(12/6 n) Longmans \$5
- 4-246 Personal experiences and historical résumé; an epitome of all that is at present known of this Switzerland of America. Abundant photographic illustrations and valuable original map.
Ath. 1903, 2:607; Dial, 36:156; Sat. R. 97:85
- 917.4 Bacon, E. M.** Literary Pilgrimages in New England.
Silver \$2
- 3-32 Visits to homes of authors and to scenes associated with their writings. Compact with information and pertinent quotation. Map and many illustrations, well chosen as to subject but poorly executed. Katharine Abbott's *Old Paths and Legends of New England*, Putnam \$3.50 n., deals in familiar style with historic and literary associations in Massachusetts, Rhode Island and New Hampshire and is rich in beautiful halftones from photographs.
Bacon, *Nation*, 76:209; Lit. W. 34:54; Abbott, *Nation*, 77:208; Lit. W. 34:263

- 917.8 *b* Adams, Andy. Log of a Cowboy. Houghton \$1.50
 3-12817 Narrative of a five months' trip with 3000 cattle, from Mexico to Montana, in 1882, with many interesting stories told by trailmen. Critic, 43:474; Ath. 1903, 2:790; Acad. 65:563
- 917.94 Austin, Mrs M. H. Land of Little Rain. Houghton \$2 n
 3-26358 Chapters sketching arid region of southeastern California, its atmosphere, birds, beasts, flowers, the Indian, greaser and gold hunter. Admirable illustrations. Dial, 35:421; Nation, 78:391

HISTORY OF FOREIGN COUNTRIES

See also Juvenile, p. 452

- 944.08 Hanotaux, Gabriel. Contemporary France. 4v. v.1 (1870-1873) Putnam \$3.75 n
 Belongs to class of histories whereof the work of Thucydides is a famous example—a contemporary's narrative of events set forth after a sufficient lapse of time to ensure some perspective. Nation, 77:96; Ath. 1903, 1:490; Sat. R. 95:803 (Bodley)
- 954 Poole, Stanley Lane-. Mediaeval India under Moham-
 medan Rule, 712-1764. (Story of the Nations)
 Unwin 5/ Putnam \$1.35 n
 3-2200 Professor Lane-Poole is the master of an excellent English style and has strong human sympathies and an eye for the picturesque, combined with full knowledge of his subject. Amer. Hist. R. 9:139
 Nation, 76:249; Sat. R. 96:114; Dial, 35:93; Ath. 1903, 2:177
- 980 Dawson, T: C. South American Republics. 2 pt. pt
 1, Argentina, Paraguay, Uruguay, Brazil. (Story
 of the Nations) Putnam \$1.35 n
 3-25616 Narrates separately the stormy histories of the four countries from earliest period to present. Dial, 36:205; Lit. W. 35:10

AMERICAN HISTORY

See also Juvenile, p. 452 and New editions, p. 455

- 970.4 James, G: W. Indians of the Painted Desert Region:
 Hopis, Navahoes, Wallapais, Havasupais. Little \$2 n
 3-19707 Outcome of 20 years' study and personal observation during journeys in Colorado, Utah, Nevada, New Mexico and Arizona. Over 60 photographic illustrations. Nation, 78:156
- 971.4 *b* Parker, Gilbert & Bryan, C. G. Old Quebec—the
 Fortress of New France. Macmillan \$3.75 n
 3-25903 Consecutive history, based on Parkman and others, making no claim to originality. Photogravures, woodcuts, halftones, maps. Romance, pathos, stirring incident, noble characters, give vivid interest to every stage. Dial, 35:424
 Spec. 91:704; Sat. R. 96:646; Nation, 77:484

- 972.98 c Heilprin, Angelo.** Mont Pelée and the Tragedy of Martinique. Lippincott \$3 n
- 2-30398 Study of the great catastrophes of 1902 with observations and experiences in the field. Photographic illustrations. Accurate and permanent record, by a trained geologist who writes from the closest personal observation. *Sat. R.* 96:237
Critic, 42:375; *Dial*, 34:245; *Nation*, 76:152
- 973 Adams, C. K. & Trent, W. P.** History of the United States. (Allyn & Bacon's Ser. of School Histories) Allyn \$1.50
- 3-2705 Special aims to present fully and fairly (1) southern point of view in Civil War questions; (2) British side in Revolutionary period; (3) importance of the West in national development. Chronologic table, bibliographic references, 200 illustrations, 35 maps, good index.
 Larned's admirable *History of the United States for Secondary Schools*, Houghton \$1.40 n., is also fully equipped with bibliographic aids, maps etc.
Amer. Hist. R. 8:765 (F. H. Hodder)
- 973.782 Avary, M. L. ed.** A Virginia Girl in the Civil War. Appleton \$1.25 n
- 3-2700 Dramatic experiences of the young wife of a Confederate officer, in camp, hospital, blockade running, etc.
Critic, 43:182; *Dial*, 34:275; *Nation*, 76:227
- 973.782 a Gordon, J. B.** Reminiscences of the Civil War. Scribner \$3 n
- 3-26356 Its manly tone, optimistic temper and cordial appreciation of opponents commend it to readers of all sections.
Acad. 66:296; *Dial*, 35:302; *Nation*, 78:373; *Spec.* 92:667
- 974.46 Howe, M. A. DeW.** Boston, the Place and the People. Macmillan \$2.50 n
- 3-26974 Reviews salient historical facts but devotes major part to 19th century, three main topics being the unitarian controversy, the literary leaders and the antislavery propaganda. Many well chosen illustrations.
 For the general reader, the best compact work on Boston which has yet been produced (1903). *Atlantic*, 93:279
Bookman, 19:201; *Ath.* 1904, 1:201; *Nation*, 77:471
- 974.7 c Janvier, T. A.** Dutch Founding of New York. Harper \$2.50 n
- 3-25273 An historical essay rather than a formal history of the beginnings of New York city. Illustrated.
 Will be useful in correcting the false impressions created by Irving's skilful and humorous misrepresentation of the Dutch. *Dial*, 36:203
Critic, 43:567; *Lit. W.* 34:301; *Nation*, 77:467

BIOGRAPHY

See also Juvenile, p. 452

- Arblay, Mme d'. Dobson, Austin.* Fanny Burney (Madame d'Arblay). (English Men of Letters, Amer. Ser.) (2/n) Macmillan 75c n
- 3-28862 A fascinating little biography, handled with that practised elegance of style, cunning of pictorial narrative, allusive deftness, and finished sense of proportion, in which he has scarce a rival. *Acad.* 65:582
Bookman, 18:641 (Richard Garnett); *Dial*, 36:207; *Nation*, 78:18; *Spec.* 91:971
- Beaconsfield, earl of. Meynell, Wilfrid.* Benjamin Disraeli. Appleton \$3 n
- 3-30490 Scrap book, rather than biography, furnishing no consecutive account or judicial estimate of his career. Will serve some future biographer as a source and meanwhile entertain the lover of personal anecdote.
Ath. 1903, 2:445; *Dial*, 35:461; *Nation*, 78:115; *Spec.* 91:654
- c Beecher. Abbott, Lyman.* Henry Ward Beecher. Houghton \$1.75 n
- 3-28566 Portrays the great Brooklyn preacher from long personal acquaintance, as a man, as pastor, as reformer and as patriot.
Dial, 36:42; *Nation*, 77:530; *Spec.* 92:227
- Bridgman. Howe, Maud & Hall, F. H.* Laura Bridgman: Dr Howe's Famous Pupil and What he taught Her. Little \$1.50 n
- 3-25614 Drawn from Dr Howe's written notes and the journal and letters of the blind, deaf and dumb girl.
Less intimate and personal than Helen Keller's *Life*, as the subject is less original and remarkable, it is nevertheless most interesting.
Lit. W. 34:341; *Nation*, 77:392; *Spec.* 92:420
- b Bryce, James.* Studies in Contemporary Biography. (10/n) Macmillan \$3 n
- 3-10346 Beaconsfield, Dean Stanley, Anthony Trollope, J. R. Green, Parnell, Gladstone, E. L. Godkin, E. A. Freeman, Cardinal Manning, Lord Acton and 10 other character estimates.
Dial, 35:10; *Nation*, 76:400; *Sat. R.* 95:551; *Spec.* 90:822
- Caesar. Firth, J. B.* Augustus Caesar and the Organization of the Empire of Rome. (Heroes of the Nations) (5) Putnam \$1.35 n
- 3-4996 Of solid worth. *Nation*, 76:251
The only biography of Augustus in English save that by Mr Shuckburgh, published almost simultaneously in England, Unwin 16/. The *Athenaeum* 1903, 2:307 says: Each is an excellent and independent study of the same evidence. In some places we prefer one, in some the other.
Sat. R. 96:112; *Ath.* 1903, 1:427
- Deutsch, Leo.* Sixteen Years in Siberia. Dutton \$4 n
- 4-4399 Experiences of a Russian revolutionist. Simple, straightforward, free from sensationalism or striving for effect. Those who read it will understand why Tolstoi wrote *Resurrection*. *Acad.* 65:494
Nation, 78:35

- Eggleston, Edward.* **Eggleston, G: C.** *The First of the Hoosiers.* Drexel Biddle \$1.20 n
- 3-25612 *Reminiscences of author's brother, and of pioneer days in Indiana.*
- b Gladstone.* **Morley, John.** *Life of William Ewart Gladstone.* 3v. Macmillan \$10.50 n
- 3-25347 *A masterpiece of historical writing, of which the interest is absorbing, the authority indisputable, and the skill consummate.* *Sat. R.*
- Sat. R.* 96:493, 517; *Dial*, 35:410; *Nation*, 77:296, 384; *Ath.* 1903, 2:473, 507
- Greeley.* **Linn, W: A.** *Horace Greeley.* (Appleton's Historic Lives Ser.) Appleton \$1 n
- 3-6577 *Newspaper sketch of founder of Tribune, showing his attitude toward successive national events during his editorship.*
- In inverse ratio to Parton's Life of Greeley, one finds here the politician first, the reformer next, and the man last of all.* *Dial*, 34:342
- Nation*, 76:299
- c Hoar, G: F.* *Autobiography of Seventy Years.* 2v. Scribner \$7.50 n
- 3-29308 *Of wide interest because of personality, engaging style, and value as a contribution to political history. He has been United States senator from Massachusetts since 1877.*
- Dial*, 35:343; *Critic*, 44:49 (J. L. Gilder); *Nation*, 78:92; *Outlook*, 76:311 (Lyman Abbott)
- a Keller, Helen.* *Story of my Life, by Helen Keller; with her Letters, and a Supplementary Account of her Education.* Doubleday \$1.50 n
- 3-7188 *Letters and experiences of this well known girl, blind and deaf from infancy.*
- One of the rare books that delight general readers and compel attention from students of educational methods.*
- Dial*, 34:271 (Joseph Jastrow); *Outlook*, v.74, pt 1, p.189; *Acad.* 66:325
- Madison.* **Hunt, Gaillard.** *Life of James Madison.* Doubleday \$2.50 n
- 3-4211 *First of a series telling the history of the United States through lives of its great men. Scholarly and important to student, but probably of less interest and practical value to average reader than Sidney Howard Gay's biography.*
- Amer. Hist. R.* 9:170; *Nation*, 77:270
- Poe.* **Harrison, J. A.** *Life and Letters of Edgar Allan Poe.* 2v. Crowell \$2.50 n
- 3-9357 *Draws a new portrait in the light of newly discovered letters and facts. Letters to and from Poe fill second volume.*
- Critic*, 42:499
- Rainsford, W: S.** *A Preacher's Story of his Work.* Macmillan \$1.25 n
- 4-1666 *Reported as literally as possible from Dr Rainsford's own words in describing his work in his New York parish, and his preceding training.*

Scott, W: E. D. Story of a Bird Lover.

Macmillan \$1.50 n

- 3-6872 Biography, revealing both the natural aptitude and the process of training which have made him an authority on ornithology and a keen observer of nature in general.

Nation, 76:523; Dial, 34:364; Critic, 43:168

b Stevenson. **Stevenson, Mrs M. I.** From Saranac to the Marquesas. (Methuen 6/n) Scribner \$2 n

- 4-9508 Letters written by mother of Robert Louis Stevenson during their sojourn in the Adirondacks and subsequent cruise in the South seas, 1887-88. Portraits.

Ath. 1903, 2:645; Critic, 44:72 (W: Archer)

Stuart. **Lang, Andrew.** Prince Charles Edward Stuart, the Young Chevalier. Longmans \$1.50

- 3-12842 Cheaper edition of the life published by Goupil in 1900, based largely on the Stuart papers at Windsor castle. A careful and faithful portrait of the hapless prince.

Ath. 1900, 2:269; Nation, 72:33; Dial, 29:424; Lit. W. 34:171

Thackeray. **Whibley, Charles.** William Makepeace Thackeray. (Modern English Writers) (W. Blackwood 2/6) Dodd \$1 n

- 3-30584 Fresh and keenly critical, but somewhat cold and lacking in sympathy. *Pittsburgh*

Ath. 1903, 2:539; Dial, 36:240; Sat. R. 96:615; Spec. 91:769

Trowbridge, J: T. My Own Story. Houghton \$2.50 n

- 3-22579 Reminiscences of his long and active literary career and of acquaintance with many distinguished people, mainly New Englanders. Written in his 76th year.

Nation, 77:287; Dial, 35:254

Victoria. **Lee, Sidney.** Queen Victoria. Macmillan \$3

- 3-5272 Expansion of article in *Dictionary of National Biography*.

He has been conspicuously successful in resisting the temptation to write as a courtier. A book likely to remain for a long time the standard authority. *Nation*, 76:175

Sat. R. 94:772; Ath. 1902, 2:818; Spec. 90:16

a Waddington, Mrs M. A. (King). Letters of a Diplomat's Wife, 1883-1900. Scribner \$2.50 n

- 3-12886 The American born wife of the French ambassador at Moscow and London gives vivid impressions of historic personages and scenes in informal family letters.

Dial, 35:14; Nation, 76:480; Ath. 1903, 1:783; Bookman, 17:457

Whittier. **Carpenter, G. R.** John Greenleaf Whittier. (Amer. Men of Letters) Houghton \$1.10 n

- 3-26621 Contributes some new material, and emphasizes political and reformatory aspects of his life more than literary and poetic.

Dial, 36:203; Lit. W. 35:43; Nation, 77:450

c Wister, Sarah. Sally Wister's Journal. Ferris \$2

- 3-29 Kept by a Quaker girl near Philadelphia, 1777-78. Of some value as a historical document, but more interesting as a picture of genuine girlhood, interested in pretty clothes and mild flirtations.

Acad. 65:187; Ath. 1903, 1:680; Nation, 76:171

FICTION

See also Juvenile, p. 453 and New editions, p. 455

- b Allen, J. L.** *Mettle of the Pasture.* Macmillan \$1.50
 3-15441 Painful in its situations, a sermon against untruthfulness rather than an artistic story, yet marked by characteristic grave beauty of style.
 Dial, 35:218; Bookman, 18:78; Ath. 1903, 2:309
- Brady, C. T.** *The Bishop.* Harper \$1.50
 3-9630 The very human and lovable bishop is the connecting link between 15 dramatic stories of frontier life.
 Dial, 34:375; Lit. W. 34:150
- b Brown, Alice.** *Judgment.* Harper \$1.25
 3-23049 Character study dealing with a masterful man's relations to his family. Swift moving, with considerable incident.
 Dial, 35:264; Bookman, 18:302; Nation, 78:54
- Chambers, R. W.** *Maids of Paradise.* Harper \$1.50
 2-24324 Brisk romance of love and adventure during the Franco-Prussian War. Paradise is a Breton village and the hero an American employed by the imperial military police.
 Ath. 1903, 1:281; Dial, 35:261
- Conrad, Joseph.** *Youth, and Two other Stories.* McClure \$1.50
 3-5183 Three grim tales of sea and land entitled *Youth*; *Heart of Darkness*; *The End of the Tether*.
 Nation, 76:478; Ath. 1902, 2:824
- Couch, A. T: Quiller-.** "*Q*" *pseud.* Hetty Wesley. Macmillan \$1.50
 3-24819 Partly true, partly fictitious, the unhappy story of the beautiful, wayward sister of John and Charles Wesley is handled with delicacy and sympathy.
 Ath. 1903, 2:577; Bookman, 18:622; Nation, 78:55; Spec. 91:916
- b Crawford, F. M.** *The Heart of Rome: a Tale of the "Lost Water."* Macmillan \$1.50
 3-25549 Love story of modern Rome.
 Bookman, 18:412; Dial, 36:18; Nation, 77:391; Spec. 91:656
- Dahn, Felix.** *Felicitas.* McClurg \$1.50
 3-15436 Short, swift moving tale of domestic love and danger when the wave of German conquest was sweeping away Roman power in fifth century.
 Critic, 43:379; Lit. W. 34:153
- c Daskam, J. D.** *Middle-aged Love Stories.* Scribner \$1.25
 3-10796 In the Valley of the Shadow; A Philanthropist; A Reversion to Type; A Hope Deferred; Courting of Lady Jane; Julia the Apostate; Mrs Dud's Sister.
 Dial, 34:376; Nation, 76:421; Critic, 43:187
- Davis, W: S.** *Saint of the Dragon's Dale.* (Little Novels by Favorite Authors) Macmillan 50c
 3-19076 Germany in middle ages. Short tale of a hermit-saint who beards the robber barons of the Warthurg.
 Ath. 1903, 2:680

- a Deland, Mrs M. W. (Campbell).** Dr Lavendar's People. Harper \$1.50
 3-25718 Six stories of Dr Lavendar's parishioners in quaint Old Chester. Spec. 91: 978; Ath. 1903, 2:823; Critic, 44:186 (M. T. Earle)
- c Doyle, A. C.** Adventures of Gerard. McClure \$1.50
 3-22517 Vigorous well conceived anecdotes of the Napoleonic wars, related by the boastful, but brave and charming brigadier. Bookman, 18:303; Sat. R. 96:5 (Supplement Nov. 21); Nation-77:508
- Fiske, H. S.** Provincial Types in American Fiction. (Chautauqua Home Reading Ser.) Chautauqua Press \$1
 3-18310 Reviews the portrayal of local types, in New England, the South, the Mississippi valley and the West by several representative living writers, giving outlines of stories, and quotations.
- a Fox, John, jr.** The Little Shepherd of Kingdom Come. Scribner \$1.50
 3-21292 Story of sweet and tender humanities, as well as of Kentucky mountain feuds and clash of opinions rending families asunder in Bluegrass region during Civil War. Bookman, 18:158; Dial, 35:262; Nation, 77:390
- Freeman, Mrs M. E. (Wilkins).** Six Trees. Harper \$1.25
 3-4415 Stories of homely New England village life, in each of which a tree exercises a subtle but potent influence on the characters. Nation, 76:276; Sat. R. 96:20; Critic, 43:185
- Garland, Hamlin.** Hesper. Harper \$1.50
 3-24946 A unionist strike among the wildest scenery of far western mountains is background for the wooing of a heroine bred to eastern society life. Dial, 36:19; Ath. 1903, 2:714
- b Gray, David.** Gallops 2. Century \$1.25
 3-26165 Short stories about horses and lovers of horses.
- Hardy, A. S.** His Daughter First. Houghton \$1.50
 3-11495 Story of social life and relations. Attracts through subtleties of character drawing and conversation rather than by rush of events. Dial, 34:372; Spec. 90:943; Nation, 76:479; Ath. 1903, 1:809
- Harriman, K. E.** The Homebuilders. Jacobs \$1.50
 3-31025 Eight stories of Polish workmen in the tobacco warehouses, iron moulders shops, and other industries of (presumably) Chicago. Lit. W. 35:77; Critic, 44:474
- Henderson, C: H.** John Percyfield. Houghton \$1.50
 3-5939 Leisurely love story interwoven with descriptive passages and reflections on social questions. Scene, mainly, a Swiss chateau. Nation, 76:275; Lit. W. 34:122; Dial, 35:68
- Hill, F. T.** The Web. Doubleday \$1.50
 3-29278 A lawyer's fight against a great commercial conspiracy, complicated by relations with a case of cruel injustice wrought by varying divorce laws. Bookman, 18:650

- Hobson, Anne.** In Old Alabama. Doubleday \$1.50
 3-21301 Plantation tales, related by an old colored woman who had been "conjured" in youth; also collection of plantation songs. Capital portrait photographs.
 Critic, 43:578; Ath. 1904, 1:462
- c Howells, W: D.** Letters Home. Harper \$1.50
 3-22817 New York love story told through letters from several people whose viewpoints differ widely. A happy example of his best manner.
 Nation, 77:507; Dial, 35:263; Acad. 65:499
- Kirk, Mrs E. O.** Good-bye, Proud World.
 Houghton \$1.50
 3-21297 Love story of a New York newspaper girl who inherits a modest New England estate. Well written, cheerful, wholesome.
 Dial, 35:221
- Leonard, M. F.** The Pleasant Street Partnership.
 Wilde 85c n
 3-23432 Quiet story, full of human kindness, of an old-fashioned city neighborhood startled by a modest business enterprise.
- a London, Jack.** Call of the Wild. Macmillan \$1.50
 3-8560 Central figure a superb sledge dog whose noblest traits and primeval instincts develop together through hardship and arctic desolation. Dramatic and intensely real, it is romance, not dog psychology.
 Nation, 77:287; Bookman, 18:159; Ath. 1903, 2:279; Spec. 91:283
- c Long, J: L.** Sixty Jane. Century \$1.25
 3-25875 Stories, mostly pathetic, of the joys and sorrows of humble people.
 Pittsburgh
 Nation, 77:508
- Mitchell, S. W.** A Comedy of Conscience. Century \$1
 3-7659 Dilemma of a lady who finds in her shopping bag a valuable diamond dropped by the thief who stole her purse. Excellent to read aloud.
 Lit. W. 34:122; Critic, 43:188
- c Norris, Frank.** The Pit. (Epic of the Wheat Ser.)
 Doubleday \$1.50
 3-1580 Second novel of the unfinished trilogy entitled *The Epic of the Wheat*, of which *The Octopus* was the first.
 Nation, 76:276; Dial, 34:242
- Page, T: N.** Gordon Keith. Scribner \$1.50
 3-13056 Social and business experiences of a young southerner interested in the industrial development of his native state. Scenes, western Virginia and New York.
- a People of the Whirlpool:** from the Experience Book of a Commuter's Wife. Macmillan \$1.50
 3-12000 A protest against the false ideals and demoralizing standards set by the idle rich, enforced by contrast with simple living.
 Nation, 77:55; Outlook, N. 74, pt 2, p.547
- Rice, Mrs A. C. (Hegan).** Lovey Mary. Century \$1
 3-5787 The large-hearted girl heroine adopts a forlorn baby and herself becomes the protégé of *Mrs Wiggs of the Cabbage-patch*.
 Bookman, 17:214; Acad. 64:438; Spec. 90:615

- Richards, Mrs L. E. (Howe).** The Golden Windows.
Little \$1.50
- 3-23480 Nearly 50 fables for young and old, each with a not too obtrusive moral.
Dial, 35:432
- Scott, H. S.** "Henry Seton Merriman" *pseud.* Barlasch of the Guard. McClure \$1.50
- 3-20061 Historical romance. Scene laid in Dantzic and Russia at time of Napoleon's invasion and retreat. *Pittsburgh*
Sat. R. 96:305; Spec. 91:317; Lit. W. 34:305; Bookman, 18:622
- Seawell, M. E.** Fortunes of Fifi. Bobbs-Merrill \$1.50
- 3-23048 Pleasing light comedy, in which Pope Pius 7, a little third rate actress, Napoleon and one of his old soldiers walk the boards.
Bookman, 18:166; Lit. W. 34:306
- b Sherwood, Margaret.** "Elizabeth Hastings" *pseud.* Daphne: an Autumn Pastoral. Houghton \$1
- 3-28588 Dainty tale of a sweet American girl's adventure among the elder gods of Rome.
Bookman, 18:413
- Smith, A. C.** The Turquoise Cup; and, The Desert. Scribner \$1.25
- 3-5535 Two stories, slight in texture but excellent in workmanship. *Athenaeum* 1903, 2:344
Scenes, Venice and Sahara.
Acad. 65:291; Spec. 91:175
- Smith, Mrs A. P.** The Legatee. Houghton \$1.50
- 3-7658 Scene, a sparsely settled village in the Wisconsin forest. Story of antagonisms between mill owner and employees, of neighborhood relations, and a forest fire.
Dial, 35:66
- a Smith, F. H.** Colonel Carter's Christmas. Scribner \$1.50
- 3-25210 Deserves to rank with the rest of the Carter chronicles; it will please the colonel's old friends and make him new ones. *Dial*, 34:474
Bookman, 18:358
- c ———** The Under Dog: Stories. Scribner \$1.50
- 3-13055 Mainly tales of men whom the world has used roughly.
Critic, 43:189; Atlantic, 92:282
- Spearman, F. H.** The Daughter of a Magnate. Scribner \$1.50
- 3-25212 Breathless tale of daring feats of engineering on a Rocky mountain railroad, with accompanying love story.
Nation, 77:389; Dial, 36:121
- Stuart, Mrs R. McE.** George Washington Jones. Altamus \$1
- 3-27518 Adventures of a homeless little colored boy who offered himself as a Christmas present.
Dial, 35:477

- c Tarkington, N. B. Cherry.** Harper \$1.25
 3-25882 18th century comedy, in which a conceited and obtuse young prig tells how he wooed the heroine. Critic, 44:94; Bookman, 18:656
- Waltz, Mrs Elizabeth (Cherry).** Pa Gladden: the Story of a Common Man. Century \$1.50
 3-25874 Stories of country life in Middle West deriving unity from the personality of a childless, large hearted and sincerely religious elderly farmer. Acad. 66:273; Nation, 77:389
- b Ward, Mrs M. A. Lady Rose's Daughter.** Harper \$1.50
 3-5780 A study of temperament, but in no sense a problem novel. In no other novel has she given so many evidences of dramatic power, imagination, humor and the gift of pathos. *H. W. Mabie* North Amer. R. 176:48 (Mabie); Nation, 76:317; Sat. R. 95:296; Dial, 34:241
- Weyman, S. J: The Long Night.** McClure \$1.50
 3-23895 Scene, Geneva on eve of last attempt of house of Savoy to recapture city—the famous *escalade* of 1602. *Spec.* 91:707 Bookman, 18:428; Acad. 65:413
- c Wharton, Mrs Edith. Sanctuary.** Scribner \$1.50
 3-26865 Short, but subtle and delicately wrought psychologic study. *Pittsburgh* Bookman, 18:410; Dial, 36:118
- White, S. E: Conjuror's House.** McClure \$1.25
 3-7169 Love story set against a dark background of Canadian wilderness, where a terrible fate threatens the trespassing hero. Bookman, 17:257; Acad. 65:234; Spec. 91:1135
- a Williamson, C: N. & A. M. The Lightning Conductor.** Holt \$1.50
 4-4569 Automobile travel sketch threaded about a plot of love-making. Tour through French chateaux country to Bordeaux, skirting the Pyrenees, and through the Riviera and Italy to Sicily. Nation, 76:255; Sat. R. 95:83; Lit. W. 34:53
- Young, R. E. Sally of Missouri.** McClure \$1.50
 3-25396 Story of the soil, and its hold on its sons and daughters. Nation, 78:134

JUVENILE BOOKS

- 353 Hoxie, C: DeF. How the People Rule; Civics for Boys and Girls.** Silver 40c
 3-21315 Shows boys and girls through concrete illustrations from their own experience the importance of law and government, and explains United States local and national systems.
- 353 Ship of State (The), by Those at the Helm. (Youth's Companion Ser.)** Ginn 75c
 3-27927 12 papers by prominent officers of government, showing daily duties of president, senator, congressman, Supreme Court judge, and system by which army, navy, postoffice and other institutions are carried on. For older boys and girls. Nation, 78:50

- 398.2 Brown, A. F.** The Curious Book of Birds.
Houghton \$1.10 n
- 3-26874** Legends and fancies gathered from French, Russian, Greek and other peoples and attractively retold for children.
Critic, 43:581; Nation, 77:488
- 398.2 Forbes, C. B.** Elizabeth's Charm-string.
Little \$1.20 n
- 3-25552** Legends associated with saints, places, pictures etc. told to a group of girls whose interest is excited by a set of charms collected in Europe. Illustrated.
- 398.2 Pyle, Howard.** Story of King Arthur and his Knights.
Scribner \$2.50 n
- 3-29613** From Malory and other sources, many incidents being altered in this version for children. Author's illustrations. Reprinted from St Nicholas.
Acad. 66:169; Dial, 35:476; Nation, 77:489
- 398.2 Tappan, E. M.** Robin Hood, his Book. Little \$1.50 n
- 3-26880** Often follows ballads almost word for word, but occasionally takes liberties with story. Employs simple language, omitting many details and mannerisms of Pyle's version. Colored and black and white pictures.
Dial, 35:476
- 398.2 Winnington, Laura, comp.** The Outlook Fairy Book for Little People.
Macmillan \$1
- 3-31944** About 30 fairy tales, ballads and songs, gathered from the English, Scotch, Irish, German, French and Spanish. Illustrated.
Nation, 77:449
- 504 Lane, Mrs M. A. L. ed.** Triumphs of Science.
(Youth's Companion Ser.) Ginn 30c
- 3-2688** The Atlantic Telegraph, A Modern Observatory, Astronomical Photography, Coast Lights, Modern Great Guns, Submarine Boats, The Boston Subway, Harnessing Niagara, etc. Written in simple language, by specialists. Will interest intelligent boys.
- 590 Monteith, John & Caroline.** Some Useful Animals and What They do for Us. (Eclectic School Readings)
Amer. Bk Co. 50c
- 3-6164** The sheep, cow, horse, pig, dog, bear, ferret, cat, squirrel, ostrich, oyster, sponge, earthworm etc. For children of second or third grade. Well illustrated.
- 595.4 Patterson, A. J.** The Spinner Family. McClurg \$1 n
- 3-22831** Simple, accurate description of the characteristics and habits of many common spiders. Extremely well illustrated.
No child should be cheated out of acquaintance with Mrs Epeira, Mrs Grass Spider, Mrs Theridion and the other well dressed and industrious members of society here celebrated. Dial, 35:469
Lit. W. 35:14

- 598.2 Miller, Mrs H. M.** "Oliver Thorne Miller" *pseud.*
True Bird Stories from my Note-books.
Houghton \$1 n
- 3-10244** Short stories about habits of caged and field birds, observed by author. Will interest children, though rather bare of charms of style. Illustrations by Louis Agassiz Fuertes.
Dial, 34:363; Nation, 76:435; Critic, 43:168 (D. L. Sharp)
- 608 a Baker, R. S.** Boys' Second Book of Inventions.
McClure \$2
- 3-30997** The miracle of radium, flying machines, the earthquake measurer, electrical furnaces, harnessing the sun, etc. For older readers than *Boys' Books of Inventions*. Illustrated.
- 621.9 Barnard, Charles.** Tools and Machines. Silver 60c
- 3-16262** Explains principles and processes involved in use of hammer, knife, chisel, the borers, abraders and grinders, saw and sawmill, power hammers, etc. Illustrated.
- 640 Colson, Elizabeth & Chittenden, A. G.** The Child Housekeeper. Barnes \$1.50 n
- 3-12824** Simple lessons, with songs, stories and games, on fire building, setting table, washing dishes, bedmaking, sweeping, laundry work, mending, care of baby.
- 808.8 c Wiggin, Mrs K. D. (Smith) (Mrs Riggs) & Smith, N. A. comp.** The Posy Ring. McClure \$1.25 n
- 3-5775** Classified selections from standard poets, similar in plan to their *Golden Numbers*, but intended for younger children.
Nation, 76:479; Critic, 43:474
- 811.49 Burgess, Gelett.** More Goops and How Not to be Them. Stokes \$1.50
- 3-20886** The Goops are singularly gifted in the art of conveying wholesome reproof and warning in the form of genuine entertainment.
Critic, 43:573
- 811.49 b Sage, Betty.** Rhymes of Real Children.
Fox, Duffield \$1.50 n
- 3-28929** Quite out of the common both in external beauty and in the rare breeding and distinction and delightful humor of the verses.
Nation, 77:448
Dial, 35:478
- 821.08 Ingpen, Roger, ed.** One Thousand Poems for Children: a Choice of the best Verse, Old and New.
Jacobs \$1.25 n
- 3-31968** Classified as Rhymes for Little Ones, Cradle Songs, Fairy Land, Fields and Woods, Home, Humorous, Ballads, Girlhood, Hymns, etc.
Ath. 1903, 2:716; Spec. 1903, 2:950
- 914.21 c Mitton, G. E.** Children's Book of London.
(Black 6/) Macmillan \$2.25
- 4-2652** London children, streets, shops, palaces, the Tower, Zoo, British Museum, Westminster, the Lord mayor's show, etc. with seven historical tales. Illustrations in color.
Spec. 91:946

- 915.1 c Headland, I: T.** Our Little Chinese Cousin. (Little Cousin Ser.) Page 50c n
 3-18182 Gives in story form an account of the childhood of a little Chinese girl. Photographs and Chinese drawings.
- 917.295 Seabury, J. B.** Porto Rico. (World and its People) Silver 50c
 3-22578 Life of people, physical features, products, flora, fauna, towns, schools, government, brief sketch of history. Illustrated.
- 919.8 c Peary, Mrs J. D. & M. A.** Children of the Arctic, by the "Snow Baby" and her Mother. Stokes \$1.20 n
 3-31933 Interesting things with many pictures of them, that little Marie Peary saw and did during two winters among the Eskimos.
 Nation, 77:449; Dial, 35:479
- 938 Zimmern, Alice.** Greek History for Young Readers. Longmans \$1 n
 4-109 Conveys essential facts from prehistoric times to death of Alexander, in simple language. Useful illustrations and maps.
 Nation, 77:361
- 949.2 Griffis, W: E.** Young People's History of Holland. Houghton \$1.50 n
 3-8474 From prehistoric times to marriage of Queen Wilhelmina, treating picturesque early period most fully. Quite independent of his *Brave Little Holland*, and better adapted to children.
 Nation, 76:456
- 973 Blaisdell, A. F. & Ball, F. K.** Hero Stories from American History: Ginn 50c
 3-10206 Among those whose deeds are related are George Rogers Clark, Colonel Moultrie, Nathan Hale, Washington, Anthony Wayne, Daniel Morgan, Andrew Jackson. Intended for elementary schools.

JUVENILE BIOGRAPHY

- Horne, O. B. & Scobey, K. L:** Stories of Great Artists. (Eclectic School Readings) Amer. Bk Co. 40c
 3-11816 Attempts to interest children in art through simple tales, founded on facts, about Raphael, Michelangelo, Rembrandt, Corot, Landseer and others. Illustrated. *Picture Stories from the Great Artists*, by M. R. Cady and J. M. Dewey, (Art Reader No. 1) Richardson 50c, (759) is more elementary, intended for children who have just learned to read. Texts and illustrations relate to the work of Rosa Bonheur, Van Dyck, Landseer and Murillo. *Art Studies for Schools*, by A. M. Von Rydingsvard, Flanagan \$1. (759) discards the element of fiction, giving some facts about each of 68 artists ranging from Cimabue to John Sargent, with simple criticism or explanation of an example of his work. Its halftone reproductions, though not evenly good, are somewhat better than in either of the others.
- Scott. Barnes, James.** The Giant of Three Wars: a Life of General Winfield Scott. (Heroes of our Army) Appleton \$1 n
 3-22117 Simple and straightforward, but not childish in style.
 Dial, 35:430

- b Victoria.* **Tappan, E. M.** In the Days of Queen Victoria. (Makers of England) Lee 80c n
 3-14845 The story of the queen's life here told for girls can hardly fail both to entertain and inspire to noble living.
 Dial, 35:430

JUVENILE FICTION

- c Barbour, R. H:* Weatherby's Inning.
 Appleton \$1.25 n
 3-22513 Story of baseball and a young man's struggle against untoward circumstances in a small New England college.
- Dickens, Charles.** Story of Little David; from "David Copperfield;" ed. by F. L. Knowles. (Famous Children of Literature) Estes 75c n
 3-20058 David Copperfield's life from birth to taking refuge with his aunt, Betsy Trotwood. Nothing altered, but much omitted from original.
- Eliot, George, pseud.** Story of Little Tom and Maggie; from "The Mill on the Floss;" ed. by F. L. Knowles. (Famous Children of Literature) Estes 75c n
 3-20449 Extracts from *Mill on the Floss*, comprising life of the Tulliver children to Tom's payment of his father's debts. Much omitted, but nothing added or written down.
- Harris, J. C.** Wally Wanderoon and his Story-telling Machine. McClure \$1.60 n
 3-22518 John the Simpleton, The Crystal Bell, The Red Flannel Nightcap, Miss Liza an' de King, The Mouse Princess, etc.
 Critic, 43:573
- b Hill, Elizabeth.* My Wonderful Visit.
 Scribner \$1.20 n
 3-25201 Record of a little city girl's enchanting, never-to-be-forgotten week on a farm. *Nation*, 77:449
 Realistic in picture of country life of the older type, and no less true in portraying an imaginative child nature.
- Hopkins, W: J.** The Sandman: more Farm Stories.
 Page \$1.20 n
 3-22515 Simple stories of everyday life on a farm, like the Sandman stories published last year, which have proved extremely popular with children too young to read for themselves.
- Leonard, M. F.** How the Two Ends Met. (20th Century Juveniles) Crowell 60c n
 3-19078 A happy little school girl by her winsome ways brings the rich and poor families of a city block into friendly relations.
- c Packard, Winthrop.* The Young Ice Whalers.
 Houghton \$1.20 n
 3-22109 Henty's heroes scarcely rival these Massachusetts boys in perils or achievements, but the movement is more lifelike, the style better, and the information about arctic life and conditions really valuable and interesting. Excellent illustrations.
 Dial, 35:431; Spec. 91:739; Acad. 65:646

- Reynard the Fox**, adapted by E. L. Smythe. (Eclectic School Readings) Amer. Bk Co. 30c
 3-25202 Child's reader. Told in simple language and provided with an appropriate modern ending suggested by a child. Excellent woodcuts.
- Richards, Mrs L. E. (Howe)** More Five Minute Stories. Estes \$1 n
 3-24530 Little stories in prose and verse about driving out in a donkey cart, having a tooth pulled, playing go to sea, gathering wool, etc. For little children. Illustrated.
 Critic, 43:575
- Sandys, Edwyn.** Trapper "Jim." Macmillan \$1.50 n
 3-12812 Cheerful and lively story about boys in southern Canada, with full instruction on trapping, fishing, shooting, camping, paddling, taxidermy and kindred matters. Illustrated.
 Ath. 1903, 2:60; Dial, 35:429; Sat. R. 96:146
- Seton, Ernest Thompson.** Two Little Savages. Doubleday \$1.75 n
 3-26968 Two boys, aided by an old trapper, camp out and live as much like Indians as possible. So admirable in woodcraft that parents may safely overlook some weak and even objectionable features which boys will hardly notice.
 Critic, 43:575; Acad. 65:527
- Stein, Evaluen.** Troubadour Tales. Bobbs-Merrill \$1.25
 3-17015 Four tales of the middle ages, about minstrels, knights, pages and a little Finnish maiden. Charmingly illustrated in black, white and red.
 Nation, 77:449; Dial, 35:476
- Whistler, C: W.** For King or Empress? Nelson \$1.25
 Young Englishman's adventures in time of Stephen and Matilda and the anti-Jewish outbreak at Norwich.
 Of more than average merit. Spec. 91:947
- a White, S. E:** The Magic Forest: a Modern Fairy Story. Macmillan \$1.50
 3-16065 A little sleep-walker steps off a western train in the night and is carried off by fur-trading Ojibways who befriend him for five months.
 Nation, 77:488; Ath. 1903, 2:826
- a Wiggins, Mrs K. D. (Smith)** (Mrs Riggs). Rebecca of Sunnybrook Farm. Houghton \$1.25
 3-23481 Delightful story of an original and attractive young girl in a New England village.
 Bookman, 18:652; Nation, 78:55; Dial, 35:264; Spec. 91:873

NEW AND ENLARGED EDITIONS

- Allen, Grant.** Belgium: its Cities. 2v. (Travel Lover's Lib.) Page \$3
 3-24244 Text published in his Historical Guide Ser. 1897, Wessels \$1.25 n., (Richards 3/6). In page edition, all signs of the guidebook are removed, type and paper are pleasing and many plates are provided. 914-93
- Atkinson, G: F.** Studies of American Fungi, Mushrooms, Edible and Poisonous. Ed. 2. Holt \$3 n
 1-24428 Added chapters on uses and cultivation of mushrooms, and 10 new plates. 589.22
 Dial, 36:238
- Baby days;** a new Selection of Songs, Stories and Pictures for very Little Folks. Century \$1.50
 3-26379 Includes about 40 pages from the old *Baby Days*, with 150 pages from later numbers of *St Nicholas*. 818.4
- Chisholm, G: G.** Handbook of Commercial Geography; ed. 4 rev. throughout and greatly extended. Longmans 15/n, \$4.80
 3-28949 125 pages added and much rewritten. 338
 Nation, 78:31
- Grout, A. J.** Mosses with Hand-lens and Microscope. pt 1. Grout \$1
 3-16268 Embodies material in his *Mosses with a Hand-lens* (1900) but can hardly be called a new edition of that work, being part 1 of a much fuller treatment. Includes nearly all common mosses of the *Gray's Manual* region, with some rarer forms. Many admirably clear illustrations. 588.2
- Riis, J. A.** Children of the Tenements. Macmillan \$1.50
 3-28289 Contains stories formerly collected under title *Out of Mulberry Street*. Author says: Occasionally I have strung facts together to suit my own fancy; but none of the stories are invented. Nine out of ten are just as they came to me from life. 813.49
 Acad. 66:70
- Sharp, D. L.** A Watcher in the Woods; illus. by Bruce Horsefall. Century 84c
 4-3944 Eight papers reprinted from plates of his *Wild Life near Home* for school supplementary reading. 590
- Trevelyan, Sir G: O.** The American Revolution. 3v. v. 1, ed. 2, \$2.50 n and v. 2 in 2 pts. \$5 n Longmans
 A monument of industry, impartiality and generosity in a most vivacious and attractive form. *Nation*, 77:506
 His partiality is pronounced and it is all in favor of the Americans. *Critic*, 44:255. 973-3
 Ath. 1904, 1:74; Sat. R. 96:673

COMPARATIVE TABLE OF BOOKS PUBLISHED IN 1903

These statistics are based on lists prepared according to varying classifications and methods. The figures should therefore be regarded as only approximate. See paper on Relative Book Production by Dr E. C. Richardson in *Publisher's Weekly*, 57:805, and abstract in *Public Libraries*, 5:192.

1903	United States	Great Britain	Denmark	France	Italy
Religion and philosophy.....	616	702	163	1 039	458
Sociology.....	246	609	100	789	579
Law.....	605	87	40	519	395
Education.....	627	<i>a</i> 748	<i>b</i> 102	1 218	<i>a</i> 1 172
Science, useful arts, fine arts	935	445	268	1 149	939
Medicine and hygiene.....	354	282	55	1 226	638
Literature.....	743	315	<i>c</i> 548	740	247
Poetry and drama.....	446	391	.....	748	407
Fiction and juvenile.....	1 953	2 660	.....	591	295
History, biography, travel.....	1 209	779	267	1 553	718
Miscellaneous.....	131	1 363	1	102	349
Total.....	7 865	8 381	1 544	9 674	6 197

a Includes philology. *b* Includes juveniles. *c* Includes poetry, drama and fiction.

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Aldrich. Ponkapog Papers, 435³
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